

AMERICAN AGRICULTURE AND OUR NATIONAL SECURITY

HEARING BEFORE THE COMMITTEE ON AGRICULTURE HOUSE OF REPRESENTATIVES ONE HUNDRED FOURTEENTH CONGRESS FIRST SESSION

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CONTENTS

	Page
Conaway, Hon. K. Michael, a Representative in Congress from Texas, opening statement	1
Prepared statement	3
Peterson, Hon. Collin C., a Representative in Congress from Minnesota, opening statement	5
WITNESSES	
Negroponte, Hon. John D., former Ambassador; Vice Chairman, McLarty Associates, Washington, D.C.	5
Prepared statement	8
Submitted question	49
Beckham, D.V.M., Ph.D., Tammy R., Dean, College of Veterinary Medicine, Kansas State University, Manhattan, KS	10
Prepared statement	12
SUBMITTED MATERIAL	
Matz, J.D., Marshall L., Principal Attorney, Olsson Frank Weeda Terman Matz PC (OFW Law), submitted statement	47

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WEDNESDAY, NOVEMBER 4, 2015

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Committee met, pursuant to call, at 10:00 a.m., in Room 1300 of the Longworth House Office Building, Hon. K. Michael Conaway [Chairman of the Committee] presiding.

Members present: Representatives Conaway, Goodlatte, King, Thompson, Gibbs, Crawford, Benishek, Denham, LaMalfa, Davis, Allen, Bost, Rouzer, Abraham, Moolenaar, Newhouse, Kelly, Peterson, Costa, Walz, McGovern, DelBene, Lujan Grisham, Kuster, Nolan, Maloney, Kirkpatrick, Plaskett, Adams, Graham, and Ashford.

Staff present: Haley Graves, Jackie Barber, John Goldberg, Josh Maxwell, Mary Nowak, Mollie Wilken, Scott C. Graves, Faisal Siddiqui, John Konya, Mary Knigge, Matthew MacKenzie, Nicole Scott, and Carly Reedholm.

OPENING STATEMENT OF HON. K. MICHAEL CONAWAY, A REPRESENTATIVE IN CONGRESS FROM TEXAS

The CHAIRMAN. This hearing of the Committee of Agriculture regarding American agriculture and our national security, will come to order.

Please join me in a brief prayer. Dear Heavenly Father, we ask, Lord, for your wisdom and guidance this morning on our deliberations. The issues that face our country and our world, quite frankly, we will be talking about this morning. Please give us ears to hear and lips that speak the truth. Forgive us where we fail. And, Lord, we ask these things in Jesus' name. Amen.

The hearing will come to order. I thank our witnesses for being here, as well as the others.

Many of you may be wondering why the Committee on Agriculture would be holding a hearing on national security. A former Chairman of this Committee, the Honorable Kika de la Garza, would often tell a story when asked how long can a nuclear submarine stay underwater? The simple answer, until it runs out of food.

With fewer and fewer Americans connected to production agriculture, many in Congress fail to recognize the importance of sound agricultural policy to our national security. Sitting on the Armed Services Committee and now chairing the Agriculture Committee, I find myself in a position to highlight this important relationship.

Agriculture and national security are intertwined in many different ways; whether it is ensuring that food is available to meet nutritional needs for both those within our own borders as well as those around the world, or ensuring that food coming into our borders is disease and pest-free, or guaranteeing that farmers and ranchers have the needed policy tools in place to continue producing food and fiber.

It is my hope that in this hearing we can begin to examine the threats and vulnerabilities to agricultural security, as well as discuss the economic significance associated with those threats.

The food and agriculture industry in the United States is not only crucial to the public health and welfare of this nation, but is an important force in the economic, social, and political fabric here and abroad. The U.S. food and agriculture industry is almost entirely under private ownership, and is composed of an estimated 2.1 million farms, which are the foundations of our nearly \$1 trillion food and fiber business with over \$150 billion in exports for Fiscal Year 2014. In 2013, 16.9 million full and part-time jobs were related to agriculture, which is approximately 9.2 percent of the U.S. employment force.

From a security standpoint, there are an array of sectors ranging from farms with relatively open croplands to highly secure food and dairy processing facilities. At the retail end, small neighborhood cafés operate in markets with large supermarket chains and nationally franchised restaurants. Continuous changes in the way that food is produced, distributed, and consumed present new challenges for ensuring its safety and security.

While increasing global trade presents opportunities for raising food safety and quality standards to levels commensurate with those of the United States, it also means increasing the amount of food coming into this country. In fact, the total volume of U.S. food imports has increased 60 percent over the last decade. This heightens the importance of ensuring that products entering our borders meet our quality and safety standards.

Near-term threats to food security include weather, conflict, diseases, resource constraints, and environmental degradation. For example, large exportable supplies of key components of food production, such as phosphates, potash, and fuel oil, come from states where conflict or government actions could cause supply chain disruptions that lead to price spikes. In addition, monitoring and controlling outbreaks of agricultural diseases will become increasingly difficult as the world becomes more integrated, disease vectors shift, and domestic animal populations grow and become more concentrated.

Historically, our food safety, plant protection and animal health regulatory systems have assumed the accidental contamination of food or inadvertent introduction of animal disease or plant pest. The prospect of an intentional, or terrorist, attack on our food and agriculture industry raises grave concerns that present challenges for producers and policymakers alike. We intend to dive deeper into the Federal role and responsibility for preventing, detecting, and responding to emergencies in future hearings.

I want to thank our distinguished panel for joining us today to discuss the role U.S. agriculture plays in maintaining a strong U.S. economy and stability around the world.

Today we will hear from Ambassador Negroponte who served as the first ever Director of National Intelligence. Prior to this appointment, he served as the U.S. Deputy Secretary of State, and had several appointments as Ambassador to Honduras, Mexico, the Philippines, the United Nations, and Iraq. He has firsthand experience protecting the national security of this country, and I want to thank him for his service and leadership.

I also look forward to hearing from Dr. Tammy Beckham, Dean of the College of Veterinary Medicine at Kansas State University. Dean Beckham also has served as Director of the Institute for Infectious Animal Diseases; Director of the Texas A&M Veterinary Medical Diagnostic Laboratory; Director of the Foreign Animal Disease Diagnostic Laboratory, a part of the USDA's Plum Island Animal Disease Center; and she served as a Captain in the United States Army where she served at the Army's Medical Research Institute for Infectious Diseases. Dr. Beckham, we are glad to have you, ma'am.

While much of today's hearing will focus on threats and vulnerabilities to domestic and international food security, we must remember the importance of our producers here at home. America has the safest, most affordable, most abundant food supply in the history of the world, and that is not by accident, it is by design. Sound agricultural policy has been an integral piece of our ability to feed and clothe not only our nation, but the world. Agriculture is the backbone of the economy, and throughout history America has been able to not only survive, but thrive because our agricultural safety net helps farmers weather the bad times. We must never forget there is no food without the farmer.

President George W. Bush eloquently summed it up when he said we are a blessed nation because we can grow our own food. A nation that can feed itself is a much more secure nation.

[The prepared statement of Mr. Conaway follows:]

PREPARED STATEMENT OF HON. K. MICHAEL CONAWAY, A REPRESENTATIVE IN
CONGRESS FROM TEXAS

Good morning, and welcome to today's hearing. Many of you may be wondering why the Committee on Agriculture would be holding a hearing on national security. A former Chairman of this Committee, the Honorable Kika de la Garza, would often tell a story when he was asked: "How long can a nuclear submarine stay under water?" The simple answer, until it runs out of food.

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social and political fabric here **and** abroad. The U.S. food and agriculture industry is almost entirely under private ownership and is composed of an estimated 2.1 million farms, which are the foundations of our nearly \$1 trillion food and fiber business with over \$150 billion in exports for FY 2014. In 2013, 16.9 million full and part time jobs were related to agriculture, which is approximately 9.2 percent of total U.S. employment.

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President George W. Bush eloquently summed it up when he said "We're a blessed nation because we can grow our own food. A nation that can feed its people is a nation more secure."

The CHAIRMAN. And with that, I will turn to the Ranking Member for any comments that he has.

**OPENING STATEMENT OF HON. COLLIN C. PETERSON, A
REPRESENTATIVE IN CONGRESS FROM MINNESOTA**

Mr. PETERSON. Thank you, Mr. Chairman. And I would like to welcome today's witnesses to the Committee.

A strong ag sector and stable food supply is critical to national security, and agriculture has an important role to play when it comes to our country's national security interests. It is something I don't think a lot of people really understand, and I appreciate the Chairman giving a shout-out to our former Chairman, Mr. de la Garza, who was a great Chairman of this Committee for many years.

The CHAIRMAN. And a Texan.

Mr. PETERSON. A Texan, yes. And I am probably the only person left on this Committee who could recite the submarine story by heart because I heard it so many times. But he made his point, and it is a very valid point.

Today's hearing will allow us to examine the threats and vulnerabilities to agriculture and the economic impacts that these would have. And as people know, I have a particular interest in high-path avian influenza, and I look forward to discussing this and other threats to agriculture.

And with that, I yield back.

The CHAIRMAN. Well, we now turn to our panelists. We normally have a 5 minute rule, but given the unique nature of what today's hearing is about, and the opportunity to set a foundation for a grand strategy associated with our country as we weave agriculture and its security into the process, I will ask our witnesses to be respectful of time but don't worry about the 5 minute clock, because we really want to hear what each of you have to say.

So with that, Ambassador, the floor is yours. That same flexibility with the clock would not apply to Members.

**STATEMENT OF HON. JOHN D. NEGROPONTE, FORMER
AMBASSADOR; VICE CHAIRMAN, McLARTY ASSOCIATES,
WASHINGTON, D.C.**

Mr. NEGROPONTE. Thank you very much, Mr. Chairman, Ranking Member Peterson, and Members of the Committee. I appreciate the opportunity to discuss the relationship between national security and agriculture. And before I give a brief summary of my testimony, I would like to mention that I knew Kika de la Garza. I knew him very well because he was also head of the U.S.-Mexico Congressional Caucus that used to meet periodically, the two legislatures, and he led the delegations down to Mexico City all the time. And, of course, being from the border area there in Texas, and having a Latino background, he knew Mexico extremely well.

I also want to mention that during the course of my foreign service career and diplomatic career, I had nine overseas postings altogether during the 44 years that I worked in government, but I can hardly think of a place where I served where agriculture didn't figure prominently in one way or another in the situations we were dealing with. Whether it was a crisis of some kind, or whether it had to do with our analysis of local, political, and economic conditions; you can't understand another country in most instances un-

less you understand something about their rural areas and agricultural conditions.

And I was thinking, my first assignment in 1961 was to Hong Kong. And you would say, "Well, what does that have to do with agriculture?" Well, back then, we were trying to figure out whether there was a famine in China. And we didn't have the means of intelligence that we have today, we would just send a satellite and go survey a little bit of the terrain and so forth, and we would probably be able to figure things out pretty fast, but we couldn't back then. We relied on refugee reports, we relied on people pouring over Chinese language newspapers that got smuggled out of China. Remember, there was the Bamboo Curtain at that time. We had a whole basement of a warehouse in Hong Kong where we got all these newspapers, and then we had people translating these articles trying to look for traces of information about what the agricultural conditions were in China at that time. And we used to have some fierce debates amongst us as to just how bad conditions were because our intelligence wasn't that good.

Vietnam, of course, I served there, and what more important a country in the area for rice production, the Mekong Delta, fabulously fertile country. I was there during the war from 1964 to 1968 and, of course, agricultural production during those wartime conditions dropped precipitately, and a country that had been exporting 1.5 or so million tons of rice in 1939, before World War II, by the time of the Vietnam war, was importing food. And that was one of our major programs, a commodity import program, to satisfy the food needs of the Vietnamese people during the course of the war.

I can go on. Ecuador, biggest banana producer in the world. Mexico, of course, myriad agricultural issues, had to do with NAFTA—the whole NAFTA question intersected. And how are subsistence farmers in Mexico going to fare in the wake of becoming more globalized as the Mexican economy has. And Iraq, of course, my last post abroad, we are talking about Mesopotamia, the land of two rivers, where, an ancient civilization, they were practically the inventors of agriculture as we know it. And by the time I got there, believe me, there was nothing in the way of agricultural production. And it was really a sad story, and I don't think it has gotten much better since. But maybe some day they will restore their irrigation system that they had, which wasn't bad, and grow the date palms back that Saddam Hussein had cut down, down in the marshland areas, and so on and so forth. So you cannot escape the importance of agriculture.

The other thing I would like to say as a general observation concerning America and its standing in the world, agriculture is a public good for us, I mean, and the way we have conducted our agriculture over the past century and a half. And it is a global public good as well. How many times have countries faced severe food shortages and crises where they relied on us to help breach that gap, whether it was Russia during certain very difficult times during the period of *détente*, and elsewhere around the world? We owe that, obviously, to our farmers, but we also owe it to farsighted policymakers, starting with Abraham Lincoln back in 1861 with the Homestead Act, and all that that has implied ever since. And

thank goodness, we have kept up and nurtured the policies that were developed then.

I see I am already practically out of time. Let me just say with regard to my testimony, initially, I discussed some global trends, the globalized supply chain, which is becoming more important every day. I discussed how the issue of resource security, especially water, may become to us in the decades ahead what oil has represented in the past. And we don't have to look far beyond California to see that. But in the Middle East it is a serious problem. They say that Syria's drought over the past several years has been a really exacerbating factor to the population there, and of course, helps create fertile ground for recruitment for terrorist groups. If people are unemployed, subsistence farmers are out of a job, they have no water to grow crops, they are very vulnerable to these kind of predatory behaviors by people like ISIS.

On a positive side, the rising global middle-class, and that is going to—resulting in changes in consumption patterns, especially in the rich and middle-income countries. And that has its positive implications for United States agriculture in terms of demand for more value-added products. We saw that in Mexico in the wake of the NAFTA, and our exports of value-added and finished agricultural products is very good.

There is the trend of skepticism of science, especially biotechnology, that has been an issue, especially with genetically-modified crops. I think most of us here in America see that as a problem and an issue with the countries that have been resisting that, and it is going to be something we are going to have to deal with as we go on in the future.

There is the long-term trend of rising energy prices. It doesn't seem that way right at this moment with the low price of oil and the low price of natural gas, but the longer-term trend is going to continue to be high, and how agriculture copes with the rising input costs.

And then last, I would say there is the exclusion of too many people from the global economy; some 1.4 billion subsistence farmers around the world who cannot make ends meet, and who are becoming even increasingly marginalized by our increasingly globalized economy. I can think, again, back to Mexico, of those maize farmers, the corn farmers in Mexico who grew corn for subsistence. And obviously, once we got the NAFTA and we succeeded in getting the agricultural sector trade opened up between the two countries, with just a couple of exceptions, this was going to be a threat to the subsistence farmers in that country, and all the social ramifications of that issue; people coming from the countryside and into the cities. And as you know, in Mexico they don't necessarily stop when they get to Mexico City or Monterrey or Guadalajara, they just keep on coming up to the United States. So there are a lot of implications to the fact of subsistence farmers not being able to squeeze out a living.

Let me stop there, Mr. Chairman. I am sorry I ran over, but there is so much to talk about.

[The prepared statement of Mr. Negroponte follows:]

PREPARED STATEMENT OF HON. JOHN D. NEGROPONTE, FORMER AMBASSADOR; VICE
CHAIRMAN, McLARTY ASSOCIATES, WASHINGTON, D.C.

Thank you Chairman Conaway, Ranking Member Peterson, and Members of the Committee. I appreciate this opportunity to discuss the relationship between national security and agriculture.

Agricultural Megatrends

Before I focus on the agriculture and national security nexus, I wanted to look at some of the major trends affecting global agriculture to provide some background. With a pressing need to feed the future world of nine billion people and manage emerging national security challenges, we need to look at the big picture as we map our way forward.

One trend is toward an increasingly globalized supply chain with our food supplies increasingly dependent on trade. While access to the world market has generally reduced food prices and improved access to food during local production shortfalls, it also highlights the need to secure market access for our agricultural exports while ensuring the safety and reliability of our imports. Looking further out, it may also necessitate consideration of how to secure food supplies for potentially vulnerable U.S. allies such as Japan.

A second issue is the evolving relationship between food and resource scarcity. Over time, rising competition for limited resources such as water and arable land could affect political stability and shift military priorities. For example, this could fuel further instability in the Middle East, where water scarcity in particular has the potential to aggravate interstate conflict. Water scarcity plays a significant role in both Syria and Iraq, where rivers, canals and dams are military targets. Over time, these and other resource constraints along with pressures from climate change could slow down increases in productivity.

The next trend is the rising global middle class, which is expected to double in size in the next decade. According to the U.N. Food and Agriculture Organization, the world must increase food production by 50 to 60 percent to satisfy expected global population growth and changing consumption patterns by 2050. This could transform markets for many food products. In East Asia and Sub-Saharan Africa, per capita meat consumption by weight is projected to increase by 55 percent and 42 percent by 2030. These changes will put pressure on the food production system, but will also create immense opportunities for U.S. and global agricultural producers.

At the same time, changes in our food system have also driven the fourth trend, changes in consumption in rich and middle income countries. Consumers are increasingly looking for products that are not only healthier but also have other characteristics. This not only includes products that are lower in sugar, fat and salt but those that address environmental, animal welfare, labor and other concerns. These increasing demands on the food system could reduce productivity, but could also allow entrepreneurial farmers to get better prices for high-value and differentiated products.

Rising consumer demand for value-added products has partially been driven by rising anxiety about and skepticism of science. While Western Europe has traditionally been least trustful of the food and agricultural industry, this trend of rejecting modern agricultural production technologies has spread elsewhere, including within the United States. This has been most evident in the deepening suspicion about agricultural biotechnology and support for mandatory labeling. If science skepticism accelerates, this could undermine our ability to increase production enough to feed the world.

The sixth trend is driven by energy prices. Since energy prices are one of the largest expenses in agricultural production, food prices rise with energy costs. At the same time, energy demands also divert a substantial amount of agricultural production. In the United States, around 40 percent of corn production is used for ethanol. While energy markets are famously volatile, rising long-term energy prices could drive up production costs and divert more crops to fuel use.

A seventh trend is the continuing exclusion of too many farmers from the global economy. According to the United Nations, 1.4 billion people cannot fulfil their most basic needs—and many are subsistence farmers. This continuing poverty makes millions vulnerable to weather, disease, price changes or other issues—and can drive many other problems, including refugee flows and political instability. Including poor farmers in development can increase resilience and prevent problems from worsening.

The last trend is the changing world of agricultural trade policy. Although the World Trade Organization (WTO) is still in place, the organization may be overtaken in the future by a growing number of alternative bilateral or regional trade

agreements—which numbered more than 600 in 2010. The number is higher now because of new agreements such as the recently completed free trade agreement between the European Union and Canada. These rules could complicate our ability to access markets globally—but also offer an immense opportunity if we open trade too.

At the center of all of these worldwide and regional trends is U.S. agricultural production. The United States plays a critical role in global agriculture since we are world's largest producer of beef, soybeans, corn and poultry and a top exporter of products as diverse as almonds, apples, cotton, raisins, sorghum, pork and wheat. Even in our highly globalized economy, America is still often the world's swing supplier of food.

The Agriculture-National Security Nexus

All of these trends offer a mix of threats and opportunities for the United States—but with the right approaches we can minimize the former and maximize the latter. These issues can be clustered into the global security, homeland security and economic realms.

On the global security front, energy security, access to natural resources, and continuing ability to trade food globally will be central to maintaining our security—and that of America's allies. Central to this will be the ability to move physical product through open sea lanes, the limitation of trade restricting measures, and ensuring access to reasonably priced energy and other resources.

Homeland security is connected to agriculture because of the importance of America's global supply chains and food safety issues. Although these issues have not been front and center because of the strength of the U.S. regulatory system and our status as a major net exporter, the risks do exist.

The economic dimension is tied to both farm income and to the effects on consumer prices. Domestically, the U.S. Department of Agriculture estimates that livestock and poultry production alone generates more than \$100 billion a year in revenue. The U.S. food and agriculture sector has also benefited tremendously from trade as exports totaled \$152.5 billion in Fiscal Year 2014. At the same time, Americans spend a little more than six percent of disposable income on food, one of the lowest levels in the world. The food and agriculture sector creates immense benefits for both producers and consumers—both in the United States and worldwide.

Building our Future Security

All of these topics raise the question of what is to be done. While there is not sufficient time to look at the issues in detail, I would like to offer a few thoughts—some of which were cited in documents such as the recently released Intelligence Community Assessment (ICA) on Global Food Security, along with two Development of Homeland Security Presidential Directives: HSPD-7, “Critical Infrastructure Identification, Prioritization and Protection” and HSPD-9, “Defense of United States Agriculture and Food.”

Infrastructure: Agriculture is extremely dependent on roads, rail, electricity, water and other physical infrastructure. As mentioned in HSPD-7, it is important for Federal departments and agencies to further advance efforts to protect critical infrastructure and key resources by preventing, deterring, and mitigating deliberate efforts to destroy, incapacitate or exploit them by working across agencies and with state and local governments and the private sector. Reducing the chances of attack will likely require increased investment in vulnerable or aged infrastructure and a continuing evaluation of new and emerging threats.

Biodefense: One specific kind of threat is the theme of HSPD-9, which focuses on the risks of biological attack on U.S. agriculture. The consequences of a successful attack range from economic damage to threats to food safety and public health. Although there have been no large-scale attacks, it is important to strengthen surveillance, monitoring and tracking and to enhance nationwide laboratory networks to ensure food, veterinary, plant health and clean water. As Federal retirements continue apace, we need to build up talent for the future in these areas.

Resource Strategy: Since agriculture is so tied to energy, water and other resources, we may consider these items themselves to be of strategic importance. In the decades to come, water could become to global strategy what petroleum is today, since declining food security could contribute to large-scale political instability and conflict. These problems could be aggravated by climate change—which may disrupt resource availability. To ensure that the United States, its allies and other strategically important countries have access to food, we may need to reimagine a grand strategy around these resource issues. The ICA mentions Africa, the Middle East and South Asia as particularly vulnerable to resource constraints.

Agricultural Research: In order to feed a growing global middle class and a population expected to reach nine billion by 2050, we need to increase food production. Given the constraints on land, water and other resources, the only way to do this is to boost productivity. Unfortunately, funding for vital research at the U.S. Department of Agriculture and the Consultative Group on International Agricultural Research (CGIAR) has stagnated, while the need to produce food becomes more pressing. This needs to change.

Trade Policy: One vital consideration is market access—both for U.S. exporters and those in other countries. As noted earlier, exports boost U.S. farm income and create jobs—and trade can fill in gaps in local food supplies and allow access to lower cost products. Beyond this, exports from poor countries also can support their farm incomes and boost regional and global food availability. Advancing these goals will include both support for free trade agreements such as the Trans-Pacific Partnership and measures that open the U.S. market, such as the African Growth and Opportunity Act (AGOA) and the General System of Preferences. Stronger trade agreements could also work against a repeat of 2008, where more than 30 major food exporters restricted trade in order to stem rising domestic food inflation—at the cost of their trading partners.

Support International Agricultural Development: A final issue is the pressing need to support farming systems in the developing world. Boosting agricultural production not only increases world food supplies, but it can reduce the vulnerability of political systems to weather, conflict and other shocks. Boosting rural incomes can reduce hunger, prevent the emergence of disease and reduce migration to the cities or as refugees overseas. The key to successful development is to develop market-oriented systems that improve the operation of agriculture as a business by working with farmers, host governments, investors, civil society and private industry.

There is more that needs to be done beyond the issues already mentioned. We need to reduce crop and food waste that costs approximately $\frac{1}{3}$ of all global food production. To boost production, we should focus on trade capacity-building to allow farmers in developing countries to compete in the global market. In many countries, there needs to be an assessment of counterproductive government policies that tax producers and undermine food availability. Finally, we need to find a way to encourage agriculture and food policy to align with science on such issues as biotechnology.

Although there are many challenges on the way to feeding the future world of nine billion, we can enhance both national and global security if we make the right choices now.

Chairman Conaway, Ranking Member Peterson, and Members of the Committee, thank you for the opportunity to testify before you this morning. I look forward to answering your questions.

The CHAIRMAN. Well, thanks, Ambassador, and we will get to our questions here shortly.

Dr. Beckham, 5 minutes. And again, thank you for your service in the United States Army. I appreciate that.

**STATEMENT OF TAMMY R. BECKHAM, D.V.M., PH.D., DEAN,
COLLEGE OF VETERINARY MEDICINE, KANSAS STATE
UNIVERSITY, MANHATTAN, KS**

Dr. BECKHAM. Thank you. Well, good morning, Chairman Conaway, Ranking Member Peterson, and Members of the House Committee on Agriculture.

My name is Tammy Beckham, and I am the Dean of the College of Veterinary Medicine at Kansas State University. I want to thank you for the opportunity to speak to you today regarding the importance of American agriculture and its relationship to U.S. national security.

So as we have heard, the U.S. agricultural sector is very diverse, it is complex, and it is a highly integrated enterprise whose health and productivity is vital to the national and global economy, the safety and security of our food systems, and ultimately the health and safety of the public health sector.

U.S. agricultural enterprise is a \$1 trillion business, the largest exporter of food, and employs approximately 9.2 percent of American workers. And as I testify before you today, U.S. citizens reap the benefits of a robust agricultural industry that provides them with access to safe, abundant, and affordable food. U.S. consumers spend on average only 6.4 percent of their annual expenditures on food, and if you compare and contrast this to the 11 to 47 percent globally, the robustness and productivity of our agricultural enterprise becomes readily apparent.

This is indeed a privilege that, as you well know, does not exist globally. There are currently 870 million people around the world that do not have access to safe and nutritious food in a sufficient supply, and by the year 2050, the global population is expected to exceed nine billion people. The very elements that make the U.S. agricultural system robust and productive are also the same ones that make it vulnerable to a natural or intentional introduction of a biological agent.

The U.S. agriculture and public health systems, while free from devastating diseases such as Foot and Mouth Disease, African Swine Fever, and Rift Valley Fever, as well as other highly pathogenic livestock diseases, emerging, and zoonotic diseases, are increasingly becoming a risk for an introduction of these pathogens. It has been estimated that over 75 percent of all emerging pathogens are zoonotic, and that zoonotic pathogens are twice as likely to be associated with an emerging disease than non-zoonotic pathogens. The impact from these diseases can lead to devastating economic and public health implications. A study that was recently completed by Kansas State University researchers predicted that costs associated with Foot and Mouth Disease outbreak in the Midwest U.S. and in the cattle industry could result in a total of \$188 billion in losses to the livestock industries. In addition, we recently learned firsthand from Porcine Epidemic Diarrhea Virus, or PEDv, high-path AI, just how significant these disruptions to our economy can be.

All these things said, it probably wasn't until the 2014 Ebola virus disease outbreak in the U.S. that our nation's gap in preparedness for an emerging and zoonotic disease were fully realized. We lacked licensed medical countermeasures, the scientific knowledge about Ebola virus disease in animals and livestock, and a trained workforce that was able to handle these types of diseases and knew what to do. And simply said, during this outbreak, the meaning of the term *One Health* took on new significance.

In order to mitigate the threats and vulnerabilities, and protect U.S. agricultural enterprise and our international markets, we must act immediately to address these gaps in biodefense. Despite a large amount of progress since 2001, the nation is still woefully under-prepared, and a coordinated and comprehensive biodefense program is lacking. Success in addressing the gaps will be heavily dependent on an organized, strategic, and well-funded approach, and this approach should institutionalize the One Health concept. It should be highly collaborative in nature, it should leverage all available resources, and encompass an international and global health component. We cannot ensure political stability abroad without addressing global disease issues and food insecurity at the

international level. This will require strong U.S. leadership and engagement through initiatives such as a global health security agenda.

Coordination of a true One Health approach to biodefense has not materialized. Nowhere is this more highly visible than in the stark contrast between human and animal biodefense funding. During Fiscal Year 2014, 61 percent of Federal funding for biodefense was allocated to the Department of Health and Human Services, but by comparison, one percent of the Federal Government funding was allocated to the USDA for agricultural biodefense. If the nation is to establish a robust biodefense strategy that includes the commitment to institutionalize the One Health concept, funding levels must be increased to the agricultural sector, and they must be strategically utilized.

The U.S. agricultural sector is critically important and intimately linked to national security in the U.S. Simply stated, U.S. ag security is national security. At this moment, it is critically important that the U.S. Government and its private partners come together and work to add both a sense of urgency and direction to the nation's biodefense preparedness efforts. Appointing a central office and council that could be responsible for developing and implementing a more coordinated, cohesive, and collaborative national biodefense strategy would be a large step in this direction. Furthermore, a leader or council that could assemble a robust team of Federal and industry partners could help lower barriers that prevent our ability to truly implement the One Health initiative. Barriers to the One Health initiative could be overcome with time, collaboration, interdisciplinary programs and budgets to support and incentivize working together to prepare our nation for the next emerging disease event. Indeed, the One Health concept must be understood, adopted, and become part of the fabric of the way we approach biodefense.

And finally, Chairman Conaway, Ranking Member Peterson, and Members of the House Committee on Agriculture, I want to thank you for the opportunity to speak to you today regarding the importance of agriculture to national security, and I look forward to your questions. Thank you.

[The prepared statement of Dr. Beckham follows:]

PREPARED STATEMENT OF TAMMY R. BECKHAM, D.V.M., PH.D., DEAN, COLLEGE OF VETERINARY MEDICINE, KANSAS STATE UNIVERSITY, MANHATTAN, KS

Good afternoon Chairman Conaway, Vice Chairman Neugebauer, Ranking Member Peterson, and Members of the House Committee on Agriculture,

My name is Tammy Beckham and I am the Dean of the College of Veterinary Medicine at Kansas State University.

Thank you for the opportunity to speak to you today regarding the importance of American Agriculture and its relationship to U.S. national security.

Agricultural Security and its Relationship to National Security

The food and agricultural system in the U.S. is one of sixteen critical infrastructures whose assets, systems, and networks are considered to be so vital to the U.S. that their incapacitation or destruction would have a debilitating effect on security, the national and global economy, public health and safety, or any combination thereof. The agricultural sector has been deemed a critical infrastructure for the U.S. in that the health of this enterprise is critical to ensuring the nation's economic viability, the safety and security of our food systems, and ultimately, the health and safety of the public health sector.

The U.S. agricultural sector is a diverse, complex and highly integrated enterprise whose health and productivity is vital to the national economy. Agriculture in the U.S. is a \$1 trillion business and this sector alone employs approximately 9.2% of American workers. In 2013, agriculture and agricultural-related industries contributed \$789B to the U.S. gross domestic product (GDP)¹ and in 2012, domestic animal agriculture (*e.g.*, livestock and poultry production) produced approximately 1.8M jobs, \$346B in total economic output, and \$60B in household income.² Furthermore, in the U.S., consumers spend on average, approximately 6.4% of their annual expenditures on food. This percentage is extremely low when compared to other countries whose expenditures range from 11% (Switzerland) to 47% (Pakistan).³ U.S. farmers and ranchers work hard to keep food prices low and are only able to accomplish this through increased efficiencies in production. Increased efficiencies have been gained through technological advancements in industrial food production. Threats that jeopardize our production and the security and affordability of the U.S. food system have the potential to disrupt our social structure and cause political instability.

The bulk of the agricultural enterprise is almost solely owned and operated by the private sector, and the U.S. is currently the world's leading exporter of food. When evaluating the impact on the economy, the food supply and the nation's jobs, it is clearly evident why this industry is deemed a U.S. critical infrastructure. Any disruption to the daily operations and/or productivity of this enterprise would have significant impacts on Americans' livelihoods, our food supply, the economy and our public health. Simply said, U.S. agricultural security *is* national security.

In addition to understanding the importance of the agricultural industry in the U.S. and its role in supporting national security, it is also important and critical that we understand the role of global food security in securing the homeland. Currently, 870 million people around the world do not have access to safe and nutritious food in a sufficient supply.⁴ By the year 2050, the global population is expected to exceed nine billion people. Nearly all of the growth is expected to occur in developing countries. Feeding nine billion people will demand that food production is increased by 70% and more specifically, that food production in the developing world double.⁵ Meeting these growing demands will be critical if we hope to maintain political stability in increasingly volatile regions across the globe.

Food insecurity and scarcity is well known to be one of the most potent drivers of political instability and social unrest. In fact, according to the Lugar Center, "global food security has both foreign policy and national security implications for the U.S. Diplomatic efforts to maintain peace and stability are much more difficult whenever there are food shortages contributing to extremism and conflict".⁶ Perfect examples of this have been seen throughout the Middle East and North Africa, where countries import over 1/2 of their food.⁷ Food insecurity in this region often leads to underlying structural pressures that can result in rioting and other public displays of dissatisfaction, or sociopolitical instability. In fact, it is well documented that although the Arab Spring was not about food insecurity, it is likely that the rapid rise in international food prices caused middle class urban populations in these regions to experience acute food insecurity, which provided the necessary motivation for the people to generate unrest.⁸ Therefore, it is easy to see how U.S. investments in food security and nutrition for developing countries and areas of conflict is in the interests of the U.S., as international food security and U.S. national security are tightly intertwined.⁹

¹ USDA Economic Research Service. <http://ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy.aspx>.

² *Economic benefits of the Livestock Industry*. iGROW, South Dakota State University Extension. July 2014.

³ USDA Economic Research Service. <http://www.ers.usda.gov/data-products/food-expenditures.aspx#.UuE9EHn0Ay5>.

⁴ USDA. *Food Security*. <http://www.usda.gov/wps/portal/usda/usdahome?navid=food-security>.

⁵ *How to Feed the World 2050: Global agriculture towards 2050*. High-Level Expert Forum. Food and Agriculture Organization (FAO). Rome October 12–13, 2009.

⁶ *Global Food Security. The 2050 Challenge*. The Lugar Center. <http://www.thelugarcenter.org/ourwork-Global-Food-Security.html>.

⁷ Barrett, Christopher B., ed. *Food Security and Sociopolitical Stability*. Oxford University Press, 2013.

⁸ *Food Insecurity and Unrest in the Arab Spring*. Thomas Tree, Sept. 7, 2014. <http://www.e-ir.info/2014/09/07/food-insecurity-and-unrest-in-the-arab-spring/>.

⁹ *Food, national security intertwined, experts say*. Eric Mortenson. CAPITAL PRESS, June 18, 2015.

Threats and Vulnerabilities of the U.S. Agricultural System

As I testify before you today, U.S. citizens reap the benefits of a robust agricultural industry that provides them with access to a safe, abundant and affordable food supply that is readily available on the shelves of grocery stores nationwide. This is indeed a privilege that as you well know, does not exist globally. However, the very elements that make the U.S. agricultural system robust and productive also make it vulnerable to a natural or intentional introduction of a biological agent. In fact, perhaps now, more than anytime in our history, the agricultural industries are at risk from a variety of threats that have the potential to severely disrupt our economy, our food supply and cause great harm to our public health sector.

Threats to our U.S. agricultural system can come in a variety of forms to include a natural introduction of a foreign (transboundary) animal, emerging, and/or zoonotic disease or an intentional introduction of a biological agent (agro-terrorism) into our agricultural systems. These threats would result in significant morbidity and/or mortality, cause great economic harm, adversely impact and/or disrupt our food supply and/or contribute to an adverse public health event. Many of these agents do not require weaponization, can be easily obtained, and exist naturally in areas in which terrorist groups such as the Islamic State (ISIS), al-Qa'ida, al-Shabaab, Boko Haram, and others who intend to harm the U.S. operate. In addition, the risk from emerging infectious and/or zoonotic diseases continues to threaten our animal, plant, and public health sectors.

The U.S. agricultural and public health systems, while free from devastating diseases such as Foot and Mouth Disease (FMD, since 1929), African Swine Fever (ASFV), Rift Valley Fever (RVF), and other highly pathogenic livestock and zoonotic diseases, are becoming increasingly at risk for an introduction of these and/or other emerging and/or zoonotic diseases. Impacts resulting from an introduction of a high consequence disease, agro-terrorist and/or bioterrorist agent into U.S. agricultural systems have been studied and published in peer reviewed journals. Studies indicate that the magnitude and severity of an introduction of a high consequence disease into U.S. livestock or poultry herds/flocks would be large. For example, a study recently completed by Kansas State University researchers predicted that costs associated with an FMD outbreak in the midwestern U.S. could result in a total of \$188B in losses to the livestock and allied industries and up to \$11B to the U.S. Government.¹⁰

In addition to publications highlighting the economic and social impacts of a disease incursion, we have learned first hand from recent experiences that the social, economic, and political fall out from emerging disease incursions can be devastating. In fact most recently, the U.S. has witnessed the incursion of porcine epidemic diarrhea virus (PEDv) in our swine herds (2013), highly pathogenic avian influenza (HPAI) in our poultry populations (2015) and last but certainly not least Ebola virus (EBOV) disease in our public health sector (2014). This demonstrates our vulnerability to newly emerging and re-emerging pathogens.

In the case of PEDv, the cause and route of introduction into the U.S. swine population has still not clearly been elucidated. Nevertheless, over ½ of the U.S. sow population was infected with PEDv, and the industry lost 10% (7M) of the piglets born to these sows during this outbreak.¹¹ More recently, the introduction of HPAI virus into the U.S. poultry population resulted in approximately 7.5M (7.5%) of the U.S. turkey population and 41.1M (10%) of the commercial chicken population being depopulated. The total indemnity costs for this outbreak was approximately \$191M.¹² The PEDv and HPAI outbreaks have reminded us that although we have made significant progress as a nation and as a sector preparing for both natural and intentional introductions of transboundary, emerging and zoonotic diseases, they remain continual threats to the U.S. agricultural system and we still have a tremendous amount of work to accomplish.

It was during the 2014 Ebola virus outbreak in the U.S. where the meaning of the term "One Health" took on a new significance and some of the greatest lessons were learned and largest gaps in biodefense highlighted. Gaps that were highlighted include but are not limited to: (1) a lack of available, licensed medical countermeasures (MCMs), (2) a lack of available scientific evidence to support informed de-

¹⁰*Economic impact of alternative FMD emergency vaccination strategies in the Midwestern united states.* Ted C. Schroeder, Dustin L. Pendell, Michael W. Sanderson, and Sara McCreynolds. JOURNAL OF AGRICULTURAL AND APPLIED ECONOMICS. Volume 47, Issue 01, Feb. 2015. Pp. 47–78.

¹¹*PEDv Dominates the Pig World.* Gene Johnston. September 11, 2014. http://www.agriculture.com/livestock/hogs/health/pedv-dominates-pig-wld_284-ar45068.

¹²*Update on H5Nx.* Mia Torchetti, U.S. Department of Agriculture Animal and Plant Health Inspection Service, National Veterinary Services Laboratories, August 18, 2015.

cision making on the risk of EBOV infections in companion animals and livestock to our public health sector, (3) a lack of available training for veterinarians, state and local animal health workers, first responders, and our medical counterparts that would properly prepare them for handling a high consequence zoonotic event, (4) a lack of policies and procedures that define appropriate handling of contaminated medical waste, and (5) a lack available scientific evidence to support informed development of policies and procedures for appropriate handling/care of potentially exposed companion animal and livestock. As such, it was during this outbreak that the term “One Health” came to the forefront for the majority of the veterinary and medical community.

This increased risk of the above mentioned threats to the U.S. agricultural and public health systems can be attributed to several social, environmental, and economic factors. First, there is increased movement of people, animals, plants, and products globally. Global commerce and air traffic moves at speeds that defy the ability to detect and prevent movement of diseases from their source in the early stages before detection. Indeed, animals and people can move and travel prior to clinical signs of a disease, thus arriving in another country already infected and able to spread the disease to people or animals they come in contact with. Second, trends in livestock production in the U.S. have resulted in more specialized, intensive, and concentrated farming practices where large numbers of animals are produced on a much smaller number of premises. These vertically integrated systems manage movements of animals and animal products to ensure a “just-in-time” delivery to the next location (*e.g.*, feedlot, finisher, packer, and retailer) in the food production system. Our livestock production systems execute a large number of animal movements daily. As an example, it is estimated that approximately 1M swine and 400K cattle are in transit to the next location in the production system at any one time during the day. An introduction of an agent either naturally or intentionally into these intensive farming systems could lead to wide-spread distribution through these movements within hours of its introduction into the system. Furthermore, in the event of a disease outbreak in which a “standstill” or quarantine of animal premises is the primary control strategy implemented in the U.S., maintaining business continuity through the controlled movements of animals is critical for food security and animal health and welfare.

Next, obtaining agents that can be utilized to promulgate an agro-terrorist event and/or a bioterrorist event against our agriculture and public health sectors does not require advanced capabilities. Many of the agents on the list of those most likely to be utilized to execute an agro-terrorist and/or bioterrorist event (such as FMDV, ASFV, and Ebola) are readily available in countries throughout the world and do not need advanced capabilities or weaponization. As mentioned previously, these agents are readily available in countries in which terrorist groups such as the Islamic State (ISIS), al-Qa’ida, al-Shabaab, Boko Haram, and others who intend to harm the U.S. operate. Last but certainly not least, we must not overlook the natural occurrence and emergence of diseases whether agricultural or zoonotic. Factors that lead to the emergence of disease include changes in socioeconomic, environmental and/or ecological circumstances.¹³ It has been estimated that over 75% of all emerging pathogens are zoonotic and that zoonotic pathogens are twice as likely to be associated with an emerging disease than non-zoonotic pathogens.¹⁴ In addition, there are approximately 320,000 unknown viruses that infect mammals and that have not yet been identified and/or characterized.¹⁵

Although the social, environmental and economic drivers of risks are critical to understanding the threats to the sector, there are additional factors that contribute to the vulnerability of the U.S. agriculture and public health sectors. For many of the diseases that threaten our industries, we lack the necessary MCMs for early detection, identification, response, and recovery. Although we have made significant advances with the U.S. licensure of the first FMD vaccine that could be manufactured in the U.S. and the validation and deployment of molecular assays capable of supporting early detection and response to the National Animal Health Laboratory Network (NAHLN), in order for us to effectively detect, identify, characterize, respond to, control, and recover from an outbreak of a known or emerging pathogen, we still have much to accomplish.

¹³Global trends in emerging infectious diseases. NATURE. Kate E. Jones, Nikkita G. Patel, Marc A. Levy, Adam Storeygard, Deborah Balk, John L. Gittleman, Peter Daszak. Volume 451; 21FEB2008.

¹⁴Taylor, L.H., Latham, S.M., Woolhouse, M.E. 2001. Risk factors for human disease emergence. PHIL. TRANS. R. SOC. LOND. 356:983–989.

¹⁵Anthony, S.J., *et. al.* 2013. A strategy to estimate unknown viral diversity in mammals. M. Bio. 4:e00598–13; doi: 10.1128/mBio.00598–13.

Critical Needs Remain for Protecting U.S. Agricultural and National Security

In order to mitigate these threats and vulnerabilities and protect U.S. agricultural and national security, we must act immediately to the critical needs remaining to be addressed. There is a critical need for development and licensure of additional vaccines for the remaining serotypes of FMDV and other high consequence animal and zoonotic disease agents (Classical Swine Fever (CSF), ASFV, Hendra virus, RVFV, Ebola, *etc.*). Along with the vaccines, we must develop and validate new diagnostic technologies to help us detect and identify both known and emerging pathogens. We must develop, in collaboration with the industries and stakeholders, policies and procedures to allow for an appropriate response to emerging disease affecting our industries. In addition, we must work closely with our end-users, stakeholders, and first-responders to develop a robust, integrated biosurveillance system capable of capturing and analyzing data on animal, human and wildlife health. This same biosurveillance system must simultaneously provide useful information and incentives to encourage data owner participation. We must work to develop data elements and standards that can be utilized across the agriculture and public health sectors and simultaneously work to develop policies that will allow for efficient sharing of data while working to protect the confidentiality of the data owners. We must work to identify incentives and provide rewards for participation in early disease reporting among our agricultural and public health sectors. We must work to prepare our first responders, veterinary workforce and our medical counterparts through robust training programs in early recognition, disease response, personal protection, and biosafety. And finally, we must work to support our state, local, and tribal governments in the development and exercising of response plans. In order to accomplish these lofty goals, we must work in multi-disciplinary teams to leverage knowledge and resources. We cannot simply discuss the “One Health” concept, but we must embrace it fully and ensure it is institutionalized across disciplines and recognize the value of working together to protect the U.S. agriculture and public health sectors, for indeed a healthy agricultural system equates to a safe and secure food supply and a healthy public health sector.

The ability to protect our agricultural industries, food supply, and public health sectors from natural introductions of biological agents, agro-terror threats, and emerging and re-emerging diseases is heavily dependent on an organized, strategic, and well funded approach. This approach should institutionalize the “One Health” concept, be highly collaborative in nature, leverage all available resources and encompass an international, global health component.

Since the formation of the U.S. Department of Homeland Security (DHS) in 2002 and with the release of Homeland Security Presidential Directive 9: *Defense of United States Agriculture and Food* (HSPD-9), DHS has assumed the responsibility to coordinate the overall national effort to protect the critical infrastructure and key resources of the U.S., which includes agriculture. However, the U.S. Department of Agriculture (USDA) still has the primary responsibility for protecting the agricultural sector¹⁶ and does so with support from additional agencies to include the Department of Health and Human Services (DHHS), the Department of Interior (DOI), the Environmental Protection Agency (EPA), the Federal Bureau of Investigation (FBI), the Central Intelligence Agency (CIA), the Department of Defense (DOD), and the Attorney General (AG). Despite interagency agreements that exist, the coordination of a comprehensive biodefense program against agricultural and human health threats is lacking. To date, an organized, multi-year, well-funded strategy and commitment has not materialized.

For example, recent statistics indicate that during the FY 2014, 61% of Federal funding for biodefense was allocated to the Department of Health and Human Services (DHHS). By comparison, 1% of Federal Government funding for biodefense was allocated to the USDA for agricultural biodefense. Perhaps just as significant is the discrepancy between funding for the Strategic National Stockpile (SNS, the U.S. national repository of antibiotics, vaccines, chemical antidotes, antitoxins, and other critical medical equipment and supplies), ~\$510M¹⁷ when compared to its sister entity, the National Veterinary Stockpile (NVS, <\$4M). Likewise, in 2007, the Laboratory Response Network had an annual budget of approximately \$50M¹⁸ while the animal health laboratory equivalent (the National Animal Health Laboratory Net-

¹⁶Public Health Security and Bioterrorism Preparedness Response Act, 2002. <http://www.gpo.gov/fdsys/pkg/PLAW-107publ188/pdf/PLAW-107publ188.pdf>.

¹⁷Federal Agency Biodefense Funding, FY2013–FY2014. BIOSECURITY AND BIOTERRORISM: BIO-DEFENSE STRATEGY, PRACTICE, AND SCIENCE. Volume 11, Number 2, 2013. Pp. 196–216.

¹⁸State Public Health Laboratories: Sustaining Preparedness in an Unstable Environment. March 2009, Association of Public Health Laboratories.

work (NAHLN) receives only \$6M annually to support its operations. If the nation is to establish a robust biodefense strategy that includes a commitment to institutionalize the “One Health” concept, funding levels must be increased to the agricultural sector and strategically utilized. Only then will robust interdisciplinary research programs and MCM development that include U.S. agriculture begin to keep pace with and complement ongoing activities within the human health and public health biodefense program. Of course, appropriate metrics and accountability of the dollars must accompany any increase in funding and this could be accomplished by an interagency/industry panel such as the recently suggested White House Biodefense Coordination Council.¹⁹

Conclusions

The U.S. agricultural sector is critically important and intimately linked to the national security of the United States. The agricultural and allied industries are leaders in world food production and provide the citizens of the U.S. the safest, most affordable food supply on the globe. At the same time, these industries are under tremendous pressures from external forces and as such, they are also extremely vulnerable to a wide-range of biological threats. Obviously, protection of this critical infrastructure is vital to maintaining a safe, affordable, and secure food supply, protecting public health from emerging and zoonotic diseases, and maintaining social and political stability at home.

Since the events of 2001 and the implementation of several key homeland security presidential directives, we have made significant advances in preparing our agricultural sector to face the challenges posed by a natural or intentional (agro-terrorism) introduction of a biological agent. However, as demonstrated recently during the PEDV, HPAI and EBOV outbreaks, we are often reactive in nature and less proactive when it comes to preparing for the next emerging biological threat. As such, it is critically important that the U.S. government and its private partners come together and work to add both a sense of urgency and direction to the nation's biodefense preparedness efforts. The recent report from the Blue Ribbon Study Panel on Biodefense (*A National Blueprint for Biodefense: Leadership and Major Reform Needed to Optimize Efforts*)^[20] provided strong recommendations for building a blueprint to address our nation's gaps. The report's authors called for appointing a central leader with the authority to institutionalize biodefense and the “One Health” initiative. In addition, the authors recommended the formation of a White House biodefense coordination council composed of representatives from Federal agencies, stakeholders and private industry. The formation of a biodefense panel would allow for greater coordination and provide a platform for the development of a more cohesive and collaborative national biodefense strategy. Furthermore, a leader and/or council that could assemble a robust team of Federal and industry partners could help lower barriers that prevent our ability to truly implement the “One Health” initiative. Barriers to this could be overcome with time, collaboration, interdisciplinary programs and budgets to support and incentivize working together to prepare our nation for the next emerging disease event. Indeed, the One Health concept must be understood, adopted and become part of the fabric of the way in which we approach biodefense.

Finally, Chairman Conaway, Vice Chairman Neugebauer, Ranking Member Peterson, and Members of the House Committee on Agriculture, I want to thank you for this opportunity to speak to you regarding the importance of agriculture to national security. I look forward to your questions.

The CHAIRMAN. I thank our witnesses this morning.

The chair would remind Members they will be recognized for questioning in order of seniority for Members who were here at the start of the hearing. After that, Members will be recognized in order of arrival. I appreciate the Members' understanding.

In a break from the norm, I am going to recognize Mr. Kelly to take my 5 minutes. He normally has to wait, he and Mr. Newhouse have to wait, so my 5 minutes will be taken up by Mr. Kelly.

Mr. Kelly, you are recognized for 5 minutes.

¹⁹ *A National Blueprint for Biodefense*. A Bipartisan Report of the Blue Ribbon Study Panel on Biodefense. October 2015.

^[20] *A National Blueprint for Biodefense: Leadership and Major Reforms Needed To Optimize Efforts*, Blue Ribbon Study Panel on Biodefense, October 28, 2015, http://www.biodefensstudy.org/SiteAssets/Pages/default/1425-2139_BRSP_Report_100815b%5b1%5d%5b6%5d.pdf

Mr. KELLY. Thank you, Mr. Chairman. And thank you, witnesses. Thank you, Doctor, for your service, and, Ambassador, for yours also.

Very briefly, I never got to see you in Iraq, but I was over there at the same time that you were. And most of this focuses on the defense or making sure that we protect our national interests in agriculture. But there is also a very strategic interest in the way that we use agriculture as a tool, as an offensive tool to help us in our strategic interests overseas. I had a young captain, who was older than me, but a captain in Iraq, Captain Jessie Cornelius, who was an agriculture teacher at home, during my first tour in Iraq, and I dealt mostly with the Al-Hillah Embassy there, but he was very, very good in understanding how we could use agriculture as an offensive tool to help plug into the culture there in Iraq and help them learn how to irrigate better. So I would be interested not just in the defensive aspects, but how we can use agriculture either in combination with our military units, or also as civilian organizations to strategically help the United States in other regions.

Mr. NEGROPONTE. Right. I think your point about using it as a tool is right on the mark in the sense that these countries have to also try to take a chapter out of our book.

If there wasn't so much corruption in a lot of these countries, surely they would have used more of their resources. I am thinking of states that are failing and are not meeting the needs of their population, and where the subsistence farmers are leaving the countryside, leaving the country of Syria, for example. If they had had more stable institutions and invested some of that money in developing their agriculture, having an extension service, if you spend all your money, like Saddam did, on building palaces, there isn't much left for improving the irrigation system. Governance, after all, is a really critical issue in all of this. So absolutely, there is a lot to do in encouraging supply chain development, various kinds of techniques, and here we are very much a good example for the rest of the world, a strong agricultural education system. You can't just say that farming is for uneducated people, and carry around that sort of social prejudice in your mind. You have to help farmers become smart like everybody else, because that is the new world we are operating in.

Dr. BECKHAM. I would just say that, yes, absolutely, it is incredibly important when working internationally that we utilize agriculture to develop relationships. It helps us work to develop those relationships, understanding what is going on, on the ground, and developing those relationships helps us gather intelligence of the diseases that are out there, obviously, that could come to the U.S.

I know the USDA Foreign Agricultural Service and APHIS do work a lot internationally, as well as universities are spending a lot of time internationally training folks on protecting their animals from diseases, and many of the zoonotic diseases as well. But education and extension and helping folks set up and understand how those diseases are affecting their populations are critically important for us to maintain our national security, but also for us to help folks on an international level. So I would agree.

Mr. KELLY. Thank you. And then, Ambassador, just very briefly, U.S. agriculture is critical to our infrastructure here in the United

States. A nation that can feed itself is a nation that can survive anything—logistics. What do you see as our major vulnerabilities to outside threats, in a minute please?

Mr. NEGROPONTE. Vulnerability in—I didn't catch the last part. Major vulnerability?

Mr. KELLY. From outside threats.

Mr. NEGROPONTE. With respect to our agriculture here in the United States? Well, I suppose you could probably think of several. One, of course, would be if the lanes of communication breakdown somehow, the trade routes around the world. So that is an important national security aspect. If some of our allied countries experience serious agricultural failures, that could be prejudicial if it were one of the NATO countries or Japan or South Korea or Australia. So indirectly, we would be affected by that. And then, of course, we have been talking about the threat of disease if, particularly animal disease, were to come into the country.

We had some very successful programs in Mexico that go back half a century, like defeating the Screwworm disease in Texas and pushing it into Mexico, and ultimately, during the time I was there about 25 years ago, ultimately pushing the Screwworm entirely out of Mexico itself and down into the Central American Isthmus. That was an example of very successful international cooperation between us and other countries on defeating a very serious animal disease.

The CHAIRMAN. The gentleman's time—

Mr. KELLY. Thank you, Mr. Chairman. And I yield back.

The CHAIRMAN. The gentleman's time has expired.

Mr. Peterson, 5 minutes.

Mr. PETERSON. Thank you, Mr. Chairman.

Ambassador, in your testimony you spoke about a global trend being skepticism of science. And it is interesting to me that consumers seem to embrace technology in every other part of their lives, with the exception of the food they eat. Is there anything we can do to reverse this trend?

Mr. NEGROPONTE. Well, it has been a major challenge for our scientific community and for some of our advanced agro-scientific industrial companies, like Monsanto and others. We seem to run into that issue more in Europe than anywhere else, although the countries that are also under the influence of Europe and the influence of their assistance programs as well.

You have to keep pressing these issues in trade discussions. I think that there has to be more and more dialogue. Clearly, modern science and biotechnology has an important role to play in increasing agricultural production, and helping protect agricultural products and crops and plants from disease. I think it is a question of continued education and dialogue between the scientific communities of the countries concerned. And over time, I suspect, especially if, as we predict, the world population is going to go to nine billion people, and agricultural production globally by 2050 has to increase by 50 or 70 percent, people are going to finally have to accept that science is our friend in this enterprise.

Mr. PETERSON. Thank you.

Dr. Beckham, you have talked about the lack of adequate funding for research, and I also wonder if we are doing an adequate job

in terms of understanding the vulnerability that we are creating by the increase in trade. It seems to me that we have exposed ourselves by opening up the economy to allow trade with countries that don't have the same standards that we do, and I am not sure we have the resources in place to make sure that they are doing what they should do before that stuff comes in. I was wondering what you think about the whole issue of funding being adequate to address these concerns. Obviously, the high-path avian influenza, you can't do much about the ducks coming in from Canada, I don't think there is any way to intercept them. They can shoot them in Arkansas, but other than that I am concerned that we are not keeping up with the research and other aspects to combat the threat that is out there.

Dr. BECKHAM. So I would agree with you. If you take a look at the funding that goes to agriculture, and one of the things that I pointed out, that there was a large discrepancy between the ag bio-defense funding; between the biodefense funding that goes to HHS and that the monies go to ag, we really struggle to have the means available to us to develop countermeasures to combat things, like Foot and Mouth Disease, African Swine Fever, which is an emerging disease, we saw what PEDv did to the swine industry. Just having the ability to be flexible enough and to rapidly move with resources to address those issues, to implement robust biosurveillance capabilities, the IT infrastructure to support that, to incentivize our producers. We need resources to address all of those types of things and all of those countermeasures.

I believe that having a budget, as small as it is, to address developing vaccines, to incentivize our public partners, our private partners to address those, to take on that vaccine production that clearly has no market here in the U.S., those are the types of things that we are going to have to address. And that is going to require more resources to go toward agricultural research.

The same thing with Ebola virus. When the virus came into the country back in 2014, we had a companion animal that was potentially exposed, and we had no idea what the result of that was going to be and how we were going to handle that, and we had no medical countermeasures to address that for animals as well. So we need to increase our research. I pointed out the One Health component. That is critically important because most of these diseases are zoonotic and we need to be able to address that, and we need to be able to develop countermeasures that are effective to stamp it out in the animal population before it gets to the human population.

And so we are in desperate need of additional resources on the agricultural side. Thanks.

Mr. PETERSON. Thank you.

I yield back.

The CHAIRMAN. The gentleman yields back.

Mr. King, for 5 minutes.

Mr. KING. Thank you, Mr. Chairman. And I thank the witnesses.

And I turn now to Ambassador Negroponte. I want to especially thank you for your service to this country; a long and varied service in extraordinary places. And we did first meet in Iraq, and I listened to the exchange here, Mr. Kelly, and it occurred to me not

only did Saddam not spend any money on irrigation, but he shut the water off to the swamp Arabs to dry them out.

Mr. NEGROPONTE. Yes.

Mr. KING. And so I will restrain my following comment on that and broaden this discussion out a little bit.

And that is, as difficult as it is for us here in the United States to get this right, and I have concerns about people who are trained inadvertently spreading high-path. AI, for example, I am not alleging that—concerns about it, even if we get it right in the United States, what is the degree of difficulty to get the educational system up for disease containment in other countries and around the world? We are talking about a global reach to this. That is a big question. But maybe in the center of that question could be, is there a country anywhere in the world that comes close to getting this right that we can model some things off of?

Mr. NEGROPONTE. Well, I am going to defer to Dr. Beckham on this, but I would say that the countries we can work with, generally speaking I would say, would be our allied countries, like in Europe and in Japan and Korea, Israel, where they have levels of education and training and experience that are similar in most ways to ours. There may be differences, but they are going to be of just degree only. So it is the advanced technological and scientific world with the powerful education systems that have to work together in support of trying to help build these capabilities elsewhere in the world. But I wouldn't be very optimistic in a country like Syria or Somalia that is confronting civil war that, let alone just get a family doctor or just a rudimentarily trained veterinarian is probably a huge challenge for them, but to get these sophisticated capabilities I would have thought might be quite difficult.

Mr. KING. I would accept that recommendation, as I do almost all of yours, and turn to Dr. Beckham for her response.

Mr. NEGROPONTE. I am sorry.

Dr. BECKHAM. Thank you. So it is a complex question, and I would say that we do a lot to educate our veterinarians on the role that they play in responding to these outbreaks. I don't think that we are doing enough to continue that education out in the field. We have limited resources. We have right now, obviously, the foreign animal disease diagnostic course that is taught at Plum Island. We can send folks up to that to get trained on what these diseases look like, we can send them up and get them trained on how to collect samples and how to get testing done, but we don't do a really good job of providing continuing education out in the long-run for our veterinarians in the field so that they know what to do and how to handle these diseases when they get out there. We need to do that more broadly. And that is with our first responders as well, we need to be educating them either on the foreign animal disease or on the zoonotic disease side.

Obviously, in the educational system and in veterinarian schools, we do educate them on what these diseases look like, that is part of the curriculum, but again, we can do more on that end, and we can do more, more broadly for the first responders.

Mr. KING. Well—

Dr. BECKHAM. We do work with—go ahead, sorry.

Mr. KING. Thank you. I would just point out that with the high-path AI, we were looking at a taxpayer expense of a number that approaches or perhaps exceeds \$1 billion—

Dr. BECKHAM. Yes.

Mr. KING.—and that is not the impact on the industry expense, just taxpayer expense. Your projected potential liability for a Foot and Mouth Disease outbreak, which I understood to be for the United States, \$188 billion in your testimony?

Dr. BECKHAM. For the Midwest.

Mr. KING. Okay. Just for the Midwest?

Dr. BECKHAM. Right.

Mr. KING. And so looking at the magnitude of that, what is your recommendation on livestock identification traceability, and an ability to be able to reduce the amount of quarantine we have if we are effective in our identification and traceability?

Dr. BECKHAM. So obviously, that impact comes from the number of animals that you have to stamp out or put down or depopulate. It also comes from the inability of sectors to move their products and their animals. And we know that with, for instance, the swine industry, they are very integrated, they need to be able to move animals and animal products. So that is where you see those types of numbers start to build up, and that is the impact to the industries, and you well know this.

As far as being able to do traceability, obviously, during any kind of disease outbreak, you have to be able to quickly do trace forwards and trace backs, understand where those animals have come from and where they are going to. And the only way that you are going to be able to do that is have robust records that don't take you days in a state animal health official's office to flip through boxes to get to that. So we need some sort of system, much like what the swine industry has implemented, the premise ID system, that can reduce that number of days to get back to movements of animals and animal products.

Mr. KING. Just in conclusion, digital real-time and industry-driven.

Thank you, Mr. Chairman. I yield back.

The CHAIRMAN. The gentleman's time has expired.

Mr. McGovern, 5 minutes.

Mr. MCGOVERN. Well, thank you, Mr. Chairman. And thank you both for being here. I appreciate it.

Ambassador, I am a big fan of your wife, Diana, by the way.

Mr. NEGROPONTE. Okay.

Mr. MCGOVERN. I just want to say that for the record.

This whole topic of how agriculture relates to our national security is important because usually when we talk about national security, we usually only talk about the military relationship to it. Because a good robust agriculture leads to food security, leads to more stability in other countries, leads to enhancing our own security. We have some great programs out there to help people in other parts of the world create sustainable agriculture to help feed their communities. That is a good thing. Programs like Feed the Future come to mind.

Mr. NEGROPONTE. Yes.

Mr. MCGOVERN. And we have programs like Food for Peace, the McGovern-Dole School Feeding Program. I visited a pilot program in Colombia several years ago when Ambassador Patterson was the ambassador—

Mr. NEGROPONTE. Yes.

Mr. MCGOVERN.—and this is a program where we provide food to entice kids to go to school. And a young mother told me about her son who is 11 years old, who every day they tried to recruit him for the FARC guerillas or the paramilitaries to join one of the armed actors, and they promised the mother they would feed the kid.

Mr. NEGROPONTE. Yes.

Mr. MCGOVERN. And now, she said because of this program that the U.S. had created, I don't have to make that choice, my son is in school, being fed nutritious food, learning how to read and write, and hopefully he will get out of the slum that they were living in. And so it seems to me the more we can kind of focus on this, the more people around the world like us, and the more people like us, the less they want to do harm to us. It is not a radical idea.

But I just wanted to bring up one point here. I think we also have to be looking at food security at the domestic level as a national security issue. Mission Readiness, a nonpartisan national security organization made up of retired admirals, generals, and other military leaders, has taken an active role in promoting healthy nutrition among out nation's kids and military families. They found that $\frac{1}{3}$ of American children and teens are now obese or overweight, and nearly $\frac{1}{4}$ of Americans aged 17 to 24 are too overweight to serve in our military. The hard reality is that obesity and hunger are often two sides of the same coin, with unhealthy high calorie foods cheaper, and fresh fruits and vegetables more expensive. And they talked about the importance of our school feeding programs.

Interestingly enough, our school lunch programs started in large part because young people were undernourished, and the military leaders were concerned about their fitness for service during World War II. So I would just be curious to hear any comments you have about the fact that in response to what Mission Readiness has said and how it relates to our security, that we are not even providing our own people the quality food that makes them ready for the military.

Mr. NEGROPONTE. Right. Well, of course, I am not particularly expert on that subject. I guess what I would say is just as a citizen, I am aware of the debate that goes on on these subjects and the tremendous amount of discussion that is happening around the subject of people's diets, and also the diets of people at different income levels. There seems to be a correlation between poor diet and obesity, and high incidents of diabetes and these kinds of things amongst lower-income groups, and that is something where there needs to be greater public awareness about so that it can be dealt with in our own society. We can also play a leadership role, our academic community, our research community can play a leadership role in influencing thinking on these subjects, both here and abroad.

But to your point about the international agriculture, I do think that having a strong agriculture in any given country is going to be a real factor of stability. It is what is going to root people in the countryside, it is going to keep them from depleting it and pouring into the cities, with all the problems that that brings in terms of creation of slums and so forth. And it is going to increase their sense of self-sufficiency and self-worth. I think that having a healthy agriculture can be a really vital part of the political and security strength of an individual country, and we can point to various examples around the world of that being true.

Mr. MCGOVERN. Thank you.

The CHAIRMAN. Does the gentleman yield back?

Mr. MCGOVERN. Yes.

The CHAIRMAN. The gentleman yields back.

Mr. Gibbs, 5 minutes.

Mr. GIBBS. Thank you, Mr. Chairman. Thank you to our witnesses. It is interesting.

Ambassador, you recollect a little bit about what has happened in the past. Obviously, national security and economic security in agriculture all fit together, everybody is in agreement with that, but I want to take a little bit of a different take. When you talk about this mechanism of technology, science, and I don't think enough people realize this so I am going to say it, but I can give you many examples, but the best example I have is corn production. In 1950, the U.S. national average of corn was 50 bushels an acre. When I started farming in 1975, to have a 100 bushel corn crop was considered good. That was to become my goal. Now we are doing almost twice that. And I don't know what the acres are that have declined, but we know the tillable acres in this country have been taken out of production—some acres have been taken out of production, obviously, urban sprawl and all that. And I can remember not too many years ago a 10 billion bushel corn crop was a big crop. Last 2 years, we had 14 billion bushel corn crops. So if we weren't doing—if American agriculture wasn't doing what we are doing we would have a food crisis already—

Mr. NEGROPONTE. Yes.

Mr. GIBBS.—because we have less land to get that food from, and so our production has increased. And that is why people need to realize that it is science that is a big part of that, and if we are going to go forward, we have to adopt the science, we have to have sound science, and we have to make sure it is safe science, no disagreement about that. I think that our conversation and our trade talks and everything we do, we really need to emphasize that the reason we have food security is because American agriculture production has been able to increase based on technology and best managed practices and all that. So I just wanted to reemphasize that point. And I don't know if you want to expand on that or not.

Mr. NEGROPONTE. Well, just to say it is absolutely true, and also if you look at countries that are less well-off, very often the cost of the food basket is 20, 30, 40—

Mr. GIBBS. Yes.

Mr. NEGROPONTE.—and in extreme cases, even up to 60 or 70 percent of the family budget. Well, then at that point, you can't benefit from all the other elements of global prosperity in any way,

shape or form. People themselves are going to get the message, especially in these enlarged countries that are looking to feed huge numbers of people, whether it is India or China or others, and it is going to be demanded by the populations of the world and the farmers.

Mr. GIBBS. Well, when you are hungry, you only have one problem.

Mr. NEGROPONTE. Right.

Mr. GIBBS. You know.

Mr. NEGROPONTE. That is correct.

Mr. GIBBS. We have many problems in this country because we are not hungry, I guess.

Dr. Beckham, we talk about funding for the zoonotic diseases, diseases passed from animals to humans, and in your testimony that is on the increase or potential increase, 75 percent. You talk about the need for funding for USDA and that. How is the relationship between the USDA agency, APHIS, and all that work to prevent swine flu, avian flu, and all that, work with CDC? Does that relationship need to be better, how do you see that relationship on the human side *versus* the animal side with our scientists and the CDC?

Dr. BECKHAM. Sure. So USDA, APHIS does have detailees that are at the CDC and that work in the zoonotic disease branch there, and during the Ebola virus outbreak it worked very well. There was a lot of communication between the USDA and the CDC, and they really quickly assembled a team to help us handle and put together procedures for handling animals that could be exposed. So we worked very well because we had to work across the human-animal interface.

Having said that, we were assembling those teams pretty much with the help of AVMA on the fly, and so although it worked well, all too often we are very reactive, and putting something in place that is more of a structure around creating a joint team that is working on the preparedness side and not necessarily reactive would be good. That is going to require that the human health component see the animal health component as just as important, and that is going to require that there is some oversight that incentivizes folks to start developing policies and procedures, and doing research, interdisciplinary research. There are really critical challenges that we in the animal world need to be working with our human counterparts to address before they happen, not after they happen. So since the Ebola virus outbreak, there is research going on more——

Mr. GIBBS. We might have a——

Dr. BECKHAM.—probably more research will come from that.

Mr. GIBBS.—coordination issue to make sure that our human and animal diseases scientists know the importance of what can happen on the animal side——

Dr. BECKHAM. Right.

Mr. GIBBS.—and that interaction. So that might take some leadership from Congress.

Dr. BECKHAM. Right. Some incentivization.

Mr. GIBBS. Okay.

All right, thank you, Mr. Chairman. I yield back.

The CHAIRMAN. The gentleman yields back.

Ms. Plaskett, 5 minutes.

Ms. PLASKETT. Yes, thank you, Mr. Chairman. Good morning.

I was very interested in this topic, and I am very grateful to the Chairman and Ranking Member for having this discussion. One of the things that one of my colleagues talked about were the countries that do this well. What are the countries that we feel present the most instability and are the biggest threats and concerns to the United States in terms of importing food into this country?

Mr. NEGROPONTE. You want to—

Dr. BECKHAM. Well, I can address it from the animal disease perspective, because that is a serious threat to our food supply.

So looking at areas of the world that have a lot of instability, and where the diseases that we are most concerned about are occurring, I mean you would have to take a look at the Middle East, you would have to take a look at Southeast Asia. Those are all areas, especially the Middle East, where you are seeing a lot of Foot and Mouth Disease moving across borders. You see a lot of African Swine Fever that is an emerging disease that is threatening Europe right now. If you take a look at how animals move in those regions, obviously, again, no borders—

Ms. PLASKETT. Yes.

Dr. BECKHAM.—disease knows no borders. Those are real threats to our industry here because once something like that comes into the U.S., we are going to have a mess on our hands. PEDv actually got into the United States as well, and we are not exactly sure at this point how it came in. There are some theories about how PEDv came in. I think the best thing that we can do right now is start to scan the horizon, develop disease matrixes, look at what is happening overseas in areas that we are particularly concerned with, and get a good grasp on things that we should be looking forward to. Again, being proactive instead of reactive in those regions.

Ms. PLASKETT. Okay, thank you.

Ambassador, did you have anything to add on that?

Mr. NEGROPONTE. Well, as far as the—identifying specific—

Ms. PLASKETT. Yes.

Mr. NEGROPONTE.—countries, I really don't, but I would say that in areas where we have actually engaged in discussions or trade talks, for example, I know that in the case of Mexico we had a lot of issues with Mexico about animal and plant health, and we were able to work our way through those issues, through dialogue, through ultimately having a trade agreement. And I can think of fruits and vegetables that were hard to get your hands on—

Ms. PLASKETT. Right.

Mr. NEGROPONTE.—before the North American Free Trade Agreement that we can now buy in the grocery stores here in this country. These issues are susceptible to solution, but the more dramatic cases of severe disease, I just wouldn't know what specific additional countries to mention.

Ms. PLASKETT. So when we talk about that and look at the other countries that pose those threats, is the fear, or the concern, more domestic, or is it in the food supplies or food coming from other countries? What is a bigger threat, do we believe, our own domestic possibility of disease and—

Mr. NEGROPONTE. Well, we——

Ms. PLASKETT.—and food contamination——

Mr. NEGROPONTE. Right.

Ms. PLASKETT.—or overseas and food that is imported here?

Mr. NEGROPONTE. Well, they are obviously interrelated, but it seems to me that as government—I am no longer a government official, but as somebody working on behalf of the United States, I would put priority on defending our own very precious agricultural system against these threats. So it emphasizes the importance of having constant surveillance and monitoring and tracking, and maintaining those capabilities. We were talking about earlier, there is a whole generation of people who are retiring now and it is important that those professionals and those experts be replenished in the supply of people working in our government who can help us defend against these threats.

Ms. PLASKETT. Right. Well, one of the things I am interested in when I ask this question is, in the Virgin Islands, most of our food is imported. We have a lot of our processed foods and our meats that are imported. And my concern is as to what the specific areas should be doing about food that is imported, but also we then have the real issue of those foods that we try to export having to deal with Customs and Border Protection and dealing with inspections that then cause foods to go bad.

Mr. NEGROPONTE. Yes.

Ms. PLASKETT. But the last thing that you talked about that I wanted to see if you would touch on is water security, because I as well, living on an island where it is water, water everywhere and not a drop to drink——

Mr. NEGROPONTE. Yes.

Ms. PLASKETT.—having a water supply that not only irrigates but also is drinkable water, and water that can sustain people over a protracted period of time——

Mr. NEGROPONTE. Yes.

Ms. PLASKETT.—is something that we think about quite often.

Mr. NEGROPONTE. Right, and it is a serious problem, especially acute in the Middle East and in some parts of our own country, but the Middle East is the area where you are seeing its greatest manifestations. And hopefully, we will learn the necessary lessons from that.

Dr. Beckham did you want to add something on the——

Dr. BECKHAM. No.

Mr. NEGROPONTE. Okay. All right.

The CHAIRMAN. The gentlelady's time has expired.

Mr. Crawford, 5 minutes.

Mr. CRAWFORD. Thank you, Mr. Chairman. Ambassador, Dr. Beckham, thank you for being here.

Ambassador—actually, this is probably a question for both of you. Well, I will start with you, Ambassador. In 2013, the EPA released some personally identifiable information of poultry and livestock producers, and specifically, they had geospatial business, individual data, that was released pursuant to a FOIA request by environmental groups. USDA and DHHS have expressed some concern that release of this type of information poses a biosecurity risk. I certainly would agree with that.

Do you agree that the aggregation and dissemination of detailed information on livestock facilities can pose a threat to bioterrorism, and what would you say to the EPA, and would you support proposals to caution them from that type of behavior in the future?

Mr. NEGROPONTE. Boy, well, we live in a society where Google publishes pictures of my front yard and the people who walk past it, so I don't know. You come up against this problem of freedom of information in this country, including what is being obtained through aerial reconnaissance of various sorts. I would have to look at the specifics before I were to give you a really strong opinion on that.

Mr. CRAWFORD. Dr. Beckham?

Dr. BECKHAM. Obviously, data confidentiality is incredibly important to our industries, and I would caution them against that.

I think it has been one of the things that has hampered bio-surveillance in this country. There needs to be a way that we can move forward with a robust biosurveillance program, but at the same time, we need to be able to protect the data confidentiality of our industries, and we need to assure them that we can do that. And that is going to be a difficult road, going forward, but it is one that can be done if we work with the industries closely and build it from the ground up with the industries themselves. They more than anybody want to protect their animals against disease, and again, working from the ground up with them to develop a system that perhaps is not housed within the U.S. Government, but maybe housed somewhere else, where you could ensure them the protection from FOIA and the protection from those data leaks, are going to be critically important.

There are some projects underway now that are looking at different ways of doing that, and they should be continued to be funded and supported, and they should continue to work closely with the industries as they are doing right now.

Mr. CRAWFORD. Dr. Beckham, there is a lot of attention, or at least the idea of the notion of failures of imagination when it comes to national security issues, I think that we can say that probably there was failure of imagination in regards to 9/11. Who would have ever thought that something like that would ever happen? So my thought is that if I can conjure up ideas to threaten our food supply, for example, to introduce Foot and Mouth Disease in a feedlot, surely others who have ideas of threatening our food supply, and thereby threatening our national security, have thought of this. Are we failing in failure of imagination, are we taking these things into consideration, what protocols are in place to address that? I am not a devious-type person, but I can come up with these ideas, so I know that folks that are seeking ways to harm us certainly have ideas like that. So I would like to hear from you, and then, Ambassador, your thoughts on that as well.

Dr. BECKHAM. So I don't think we are failing. I think we have made a lot of progress since 2001, and the USDA and Department of Homeland Security in the ag area, especially for livestock, have worked to make significant progress, that we just weren't there in 2001. So I don't think that we are failing. I think that we need to build on what we have done, and we need to more closely integrate ourselves with the public health sector, because I am bringing that

back to the One Health. Obviously, Foot and Mouth is a huge concern, and it would not be hard to do. And we have made significant progress. We have the first vaccine that has been licensed that you can make within the United States, and so that is great, but we have that vaccine for one serotype. And while there has been additional research and there has been more vaccines for additional serotypes in the queue, again, we are still lagging behind on moving that innovation forward for just that disease. But then you take a look at ASF, PEDv, AI, all the other threats to the industry, so we are still lagging behind in that. Not to mention the biosurveillance that I talked about before. The integrated biosurveillance system is going to be critically important to help us get a leg-up on that early detection. Obviously, the faster you can detect something like that if it is introduced into a feedlot, the faster you are going to be able to control it. That is going to be really important. That is going to require additional funding to the National Animal Health Laboratory Network. It is going to require additional funding into the biosurveillance programs that I have talked about. And so in some of those areas we are not failing so much as we just need a more coordinated approach, and we need more resources to go in to getting us there faster, because it inevitably will happen. I mean we have been free from FMD since 1929. Not hard to introduce it. It is in all the areas that we just previously talked about. We prepare ourselves for both the natural and the intentional introduction, and we have to look at it from both perspectives, right, so we are preparing ourselves for both. We have built bio-forensics capabilities in the country for attribution, should we need that.

Again, we are not failing. I think we could do more, but we certainly are not failing.

The CHAIRMAN. The gentleman's time has expired.

Ms. Adams, 5 minutes.

Ms. ADAMS. Thank you, Mr. Chairman. And thanks to both of you for your testimony today.

The recent outbreak of avian flu was highly detrimental for egg prices in the U.S., which negatively impacts consumers and our egg users in the baking and restaurant industry. Worse, disruptions in food supply hurt our most vulnerable.

Ms. Beckham, while we can't stop every pathogen that travels through our ports of entry, what investments can we make to mitigate the damage from animal diseases that harm our nation's food?

Dr. BECKHAM. Okay. So, yes, you are right, avian influenza took an impact. It may take an impact on the turkeys we have at Thanksgiving this year as well.

The things that we can do, biosurveillance, I am going to go back to it, having a robust biosurveillance system, a robust early detection system, investing in the National Animal Health Laboratory Network, coordinating better with our public health sector, investing in more vaccine and research on the upfront end so that we are not reactive but we are proactive, training our first responders, coordinating with our state and local entities. Doing all of those types of things are going to help us better prepare. The earlier we detect it, the better we are going to be able to control it, and the faster we are going to be able to get it under control. And so doing all

of those things will help us do that, and that is just absolutely where we have to continue to go.

Ms. ADAMS. Thank you very much. And let me apologize for not referring to you properly, Dr. Beckham.

The 12th District, which is the district that I represent in North Carolina, is home to my alma mater, North Carolina A&T State University, which includes the Plant Biotechnology Research Lab at Carver Hall on the campus. What opportunities are there for 1890 institutions to participate in research against crop diseases?

Dr. BECKHAM. I can speak to opportunities with livestock diseases. I know that there are opportunities in funding, opportunities for those colleges to invest and work within the system, to do research for vaccines, do youth educational training opportunities, to train first responders, K through 12 programs as well. So there are plenty of those types of opportunities out there. And when I was at Texas A&M, we did partner quite a bit to do that type of research with partners from 1890 universities.

Ms. ADAMS. Okay. And finally, Dr. Beckham, one of the major diseases that concerns farmers and the agriculture industry is an outbreak of Foot and Mouth Disease in the United States, and you have made reference to that. If an outbreak occurred in North Carolina, how quickly and effectively could a vaccine be developed for U.S. livestock?

Dr. BECKHAM. Okay, as you know, we have the North American Foot and Mouth Disease Vaccine Bank, in which we host here within the U.S., and we have antigen concentrates in that vaccine bank. If we were to have to deploy that, obviously, there is a process; you would have to detect Foot and Mouth, you would have to identify what the serotype of the Foot and Mouth Disease is because the vaccines are specific for each serotype. Once that has been done at Plum Island, then the Secretary of Agriculture has to activate the North American Foot and Mouth Disease Vaccine Bank. That antigen is then shipped over to Europe, prepared into a vaccine, and then shipped back. So we are talking within 3 to 5 days of a confirmation would we be ready to deploy vaccine. It could be more along the lines of the 5 days.

Recently, I am also aware that USDA has moved to get access to supplies that are already prepared, and they are doing the safety testing on those vaccines as well so that they would be readily available, there wouldn't be a need to ship the antigen across the ocean to get it prepared into vaccine. And so there has been some of that movement as well. So DHHS, in coordination with USDA, are looking at different methods to have vaccine more readily available in a quicker fashion. Again, some of that is how quick you detect it and then how fast you confirm what it is, and you can serotype it and then get moving on the bank.

Ms. ADAMS. Great. Thank you very much.

Mr. Chairman, I yield back.

The CHAIRMAN. The gentlelady yields back.

Mr. Abraham, 5 minutes.

Mr. ABRAHAM. Thank you, Mr. Chairman. Dr. Beckham, you and I have a little commonality, being a veterinarian, and an M.D. Also, I am very interested and impressed with your knowledge on the zoonotic diseases. And as you said in your testimony that 75

percent of the emerging pathogens are probably zoonotic in nature. And my concern is on the legislative front, this large discrepancy between DHHS and the USDA as far as biodefense allocations. Why do you think they—there is that wide chasm between both agencies, because they are fighting, hopefully, the same type of entity, why the discrepancy between the USDA and the DHHS as far as funding?

Dr. BECKHAM. I don't think I can answer why because, obviously, I am not involved in the budget preparation and so forth. I, obviously, think there needs to be a hard look at that. And again, I take it back to that institutionalization of One Health concept about how you can incentivize those two agencies to work closer together, and to develop medical countermeasures for the zoonotic diseases.

Mr. ABRAHAM. Yes.

Dr. BECKHAM. And in order to do that, I believe that you are going to have to have funding to incentivize more interdisciplinary and multidisciplinary teams.

Mr. ABRAHAM. Well, other than a major outbreak, which—

Dr. BECKHAM. Yes.

Mr. ABRAHAM.—hope never happens—

Dr. BECKHAM. Yes.

Mr. ABRAHAM.—what can we do as legislators to somewhat open the eyes of Congress to send more money to the USDA and their prevention program? Is there any program, anything we can jump on board with?

Dr. BECKHAM. I think there could be a better centralized coordination approach, perhaps an appointment of someone that is over biodefense specifically that coordinates within an interagency group to start putting objectives and putting metrics in place. Then also funding increases or funding that is generically out there that incentivizes research that is done in a multidisciplinary fashion so that funding just doesn't go to one agency, and then there is no crosstalk between DHHS and USDA, but that there is funding out there that is available for common grants, whether it is in academia, USDA or DHHS, to address those in a more multidisciplinary fashion, but the fashion has to go for the multidisciplinary approach.

Mr. ABRAHAM. All right. And let me, I guess, pony on Mr. Crawford's question. As far as the individual farming entities, what they can do. Do we, as farmers and ranchers of the country, do they form cooperatives for biodefense measures? Where would you, if you could cherry-pick what you would do for our individual large and smaller farmers, ranchers—

Dr. BECKHAM. Yes.

Mr. ABRAHAM.—as far as prevention, what would you say?

Dr. BECKHAM. It is broad. What would I do for farmers for prevention? I believe educational opportunities in biosecurity, continuing to develop the business continuity planning efforts and explaining to them why it is important for them to participate in that, and the biosurveillance. I go back to all of those things. The biosurveillance, education for our farmers on the importance of biosecurity. While, obviously, the larger companies understand that, there are still large gaps in biosecurity, and even though we have

business continuity planning efforts underway for the industries, and some of them have already been developed, they have not been implemented. And so that is a bigger problem is how you implement those business continuity planning efforts. Those types of activities within the industry itself will help get them better prepared. And then the other thing is involving them in decision-making, and making sure they are at the table. Talking about bio-surveillance, working with the industries themselves. They want to participate, they want to be protected, but how can we do that and protect their data, how can we do that and protect their confidentiality, what does that look like. And so this is a role that academia has played recently, is kind of being the go-between between the industries themselves and the Federal Government. And in some ways that has worked really well because the industries are more likely to trust the land-grant universities. And when I was at Texas A&M, we actually worked on a biosurveillance project where we worked closely with the industries themselves and we were starting to get very good reporting from veterinarians and the industries, and they wanted to participate because they see the value in being able to use that data along with the business continuity planning data to allow them to move during a disease outbreak. And so if we can continue to educate and if we can continue to work with the industries one-on-one, and assure them that we want to work with them and protect their data and educate them, those are the things that will really help them in the middle of a disease outbreak.

Mr. ABRAHAM. Thank you, Mr. Chairman. I am out of time.

The CHAIRMAN. The gentleman yields back.

Ms. Lujan Grisham, 5 minutes.

Ms. LUJAN GRISHAM. Thank you, Mr. Chairman. And I know many of my colleagues, including Congressman King, really talked about whether we are doing enough as we are importing, Dr. Beckham, beef from other countries, and whether or not we are doing everything that we can to ensure that we are not reintroducing Foot and Mouth, and other zoonotic diseases, with the viral capacity to really not just threaten our food supply and the herds, but in my state, when I look at the agricultural footprint and the value and importance of our cattle and beef industry, we could lose whole herds and farms and ranchers. That is something that certainly my constituents, and I know not just in my state, but all of us hear a lot about and are very, very concerned about. And while your efforts here to educate and to do surveillance, and that public health environment, I have to say I really applaud that we have a robust surveillance, education, and monitoring system here. But, as you were describing our abilities to do that outside of the U.S., it is not as robust, and it seems to me that we have a long way to go to create that kind of environment.

Is there anything else that you haven't had the time to hit on that gives us more confidence, because I am beginning to feel or be a little concerned that maybe that importation is a bit premature, given that we don't have those mechanisms in place in some of these other countries?

Dr. BECKHAM. So we have to rely on strong scientific evidence that is either gathered from folks working on the international

level. I know specifically what you are referring to. Obviously, risk analysis before importing any type of beef into the United States should be done. It should be a robust risk analysis based on scientific evidence. Industries need to play a role in that. And so all of those types of things need to occur.

We do work within the OIE, the World Organisation for Animal Health. And in that structure there is reporting requirements for notifiable diseases such as Foot and Mouth Disease. But you are absolutely correct, I mean one missed step in that and one introduction and we are going to lose an industry or a significant part of an industry.

So going back, it would be good for us to be able to expand to work with our international partners and develop relationships, to expand our biosurveillance outside of the U.S., which we talked about. The risk analyses, coming back to that, have to be very robust. Even though we do have a system here in the U.S., I wouldn't exactly yet call it robust.

Ms. LUJAN GRISHAM. All right.

Mr. BECKHAM. I would say there is work still to do in the biosurveillance part. And so we do have a lot of work to do. And yes, it is a risk, and yes, we have to hold accountable the strong scientific evidence behind the risk analysis.

Ms. LUJAN GRISHAM. And I have no problem with the scientific evidence—

Dr. BECKHAM. Yes.

Ms. LUJAN GRISHAM.—and I appreciate your caution about my statement that we have a robust system. In comparison to what I think our reliance—

Dr. BECKHAM. Yes.

Ms. LUJAN GRISHAM.—and security levels are around the world, I would maybe say that my comments aren't so off-base. I am—

Dr. BECKHAM. Right.

Ms. LUJAN GRISHAM.—happy to congratulate any of our—

Dr. BECKHAM. Yes.

Ms. LUJAN GRISHAM.—government partners, but I appreciate your statement that we should be doing more, but I can't imagine you don't have our support to do as much as you need to be doing. I have no trouble with the way in which we use public health measures and epidemiology and scientific evidence to identify, treat, and prevent the occurrences, and certainly the spread, but what are we doing that creates accountability? I am not suggesting that we don't know what those other countries should do, but how do we hold them accountable? What can Congress do to make sure that that accountability is occurring more than identifying these are the strategies that we expect all these other countries—and if it is just a check, we did all these things, what are we doing, and what can we do to assure that there is real accountability in a global marketplace?

Dr. BECKHAM. Again, we have to continue to work through our delegate, the USDA, with OIE and the World Trade Organization. Again, going back to the risk analysis, holding them accountable, and if they are not adhering to the standards, that we are able to verify those standards. It would be incredibly—

Ms. LUJAN GRISHAM. And—

Dr. BECKHAM.—important for us to be able to do that.

Ms. LUJAN GRISHAM. All right. And with the limited time I have left, Mr. Chairman, I would encourage the Committee to ask USDA to write to us and identify exactly what we can do when we suspect that these are not being followed, and to enhance those efforts to the highest degree that we can, because it doesn't seem to me like we are feeling very secure about our accountability efforts.

The CHAIRMAN. I thank the gentlelady. She yields back.

Mr. Benishek, 5 minutes.

Mr. BENISHEK. Thank you, Mr. Chairman. Well, thank you both for being here. Amazing résumés.

Ambassador, you mentioned something to me that I didn't quite understand, and that is that the plight of subsistence farmers, you mentioned, in some of these foreign countries has gotten worse because of global trade. Can you explain that to me?

Mr. NEGROPONTE. Well, in many, probably most cases, as imported food supplies become available in various countries, they come in at lower prices than the local subsistence farmers can produce at. I gave the example of Mexico. The maize corn farmers there simply couldn't compete with imported American corn, so that ultimately had the effect of dislocating a lot of those farmers. Now, they could go into other products but that was what I meant.

Mr. BENISHEK. I guess I have a different idea of what subsistence farming is then. I mean, to me, it was that they are growing their own food.

Mr. NEGROPONTE. Right.

Mr. BENISHEK. Does that mean they still couldn't grow their food cheaper than they could buy it? I don't understand.

Mr. NEGROPONTE. No. No, I see your point. I meant subsistence in the sense of very small, low-level production that was lots of, literally thousands of these kinds of farmers who are growing their own food, but they are also supplying some people in their environments, but a lot of them have gone out of business as a result—

Mr. BENISHEK. All right.

Mr. NEGROPONTE.—of these imports.

Mr. BENISHEK. Let me just go on then. Dr. Beckham, tell me about this One Health thing that you mentioned a couple of times, a little bit more. I am not sure I understand that either.

Dr. BECKHAM. One Health is the idea that human health, animal health, and environmental health are inextricably linked. And this is true. Obviously, you see the food supply directly impacting human health, disease impacting human health. A lot of the diseases, again, come from animals. So the concept of One Health is that working together across the disciplines, across the boundaries, that we are able to address the critical challenges that face us today globally. And so that is the idea behind One Health.

One Health has been around for a very long time, but the term most recently has started to gather more and more momentum. I think as we saw, like I said, during the Ebola virus outbreak, we knew we had a One Health issue, but all too often sometimes, again, the human health side, obviously, as it should, takes precedence. But there will be one day when we are going to have an outbreak, and it is going to be very severe in livestock or wildlife, and humans, and we are going to have to look at how we address these

things more from a holistic point of view, because in today's world I don't believe that we can just silo ourselves off and not address our issues and our challenges from a more holistic point of view.

Mr. BENISHEK. I think many have said the United States lacks a coordinated biodefense strategy. And what do you think in the development of a coordinated biodefense strategy is one or two of the most important things to do? You did mention better coordination—

Dr. BECKHAM. Yes.

Mr. BENISHEK.—besides that, what else do you have to say?

Dr. BECKHAM. I think having a council or a core panel that could coordinate biodefense activities across agencies, but that would also reach out to our industry partners and our stakeholders and bring people together to start looking at multidisciplinary ways of addressing the challenges—

Mr. BENISHEK. We don't have anything like that now?

Dr. BECKHAM. No.

Mr. BENISHEK. Ambassador, do you have any comments on that question?

Mr. NEGROPONTE. I have been out of the government long enough to not know what mechanisms actually exist at the moment, but it is certainly a subject that people think about, but I am not sure there is an actual mechanism that exists to do that.

Mr. BENISHEK. Well, in your initial comments you talked about the stability of the world in general, and the ability of local governments to feed their people as a major factor in that, and basically, you said in all your travels, agriculture is always brought up. What can we do better to stabilize this? What programs we have now and what can we improve—

Mr. NEGROPONTE. Well—

Mr. BENISHEK.—to make that better?

Mr. NEGROPONTE.—we do, of course, have problems. The Agriculture Department has some, Feed the Future, and they contribute to giving scholarships to people to come from other countries. I think that is very important to the extent that knowledge and expertise can be spread.

I think maintaining a presence, keeping eyes and ears of the Agriculture Department around the world is important. I think agricultural attachés are a great resource at the various embassies we have around the world. The Animal and Plant Health Inspection Service, they have people abroad. I think that is one of the issues that Dr. Beckham was alluding to, and also the Congresswoman who was asking about how you hold people accountable. We need to get those kinds of people out in the field and serving at critical countries and embassies around the world. For example, I know in the country of Nigeria, the most populous country in Africa, the agricultural attachés' office has been closed, and it is being covered as a regional responsibility in one of the other embassies on the continent. I think that is the kind of thing that maybe ought to be reconsidered. We need a robust presence of both our general agricultural experts and agricultural economists and our scientific people as well.

Mr. BENISHEK. Thank you. I am—

The CHAIRMAN. The—

Mr. BENISHEK. I am out of time.

The CHAIRMAN. The gentleman's time has expired.

I now recognize Mr. Newhouse for 5 minutes of questioning.

Mr. NEWHOUSE. Thank you, Mr. Chairman. Thank you both for being here this morning. I appreciate your testimony and I appreciate both of your service.

I am hopeful that Americans think about their food supply, but my guess is that they probably don't worry about it as much as many of us do. We rely on importations of a lot of food to make our food supply complete. With the potential of all kinds of things that can happen in this world; wars or some kind of an outbreak of some kind, do you think, Ambassador, should we be making plans for more secure domestic food supplies as well as farm inputs, and understanding that there is a balance of other countries' agricultural industries depend on customers abroad, but is there something more we should be doing to secure our domestic food supply in case of an adverse event?

Mr. NEGROPONTE. Well, I can't think of anything other than working as we do as a matter of national policy to try to keep the world a secure place. I mean that is going to be the best way we do it. We are blessed by having a rich agriculture and we are also blessed by having strong agricultural producers nearby, such as Canada. Compared to countries that import a substantial portion of their food needs, we are in quite a privileged position.

Mr. NEWHOUSE. Good shape, yes.

Any thoughts, Dr. Beckham?

Dr. BECKHAM. No, I would agree with that. I think we are in a privileged position, and we are doing a good job of securing the food system. I think we have, like I said, there is probably more we can do, but—

Mr. NEWHOUSE. Keep up what we are doing, basically.

Dr. BECKHAM. Keep up—

Mr. NEWHOUSE. Yes.

Dr. BECKHAM.—and continue to move forward with the innovation and the research, *et cetera*.

Mr. NEWHOUSE. So I come from the State of Washington where we have the notorious reputation, I guess, of being the place of the cow that stole Christmas back in 2003 in the Mad Cow Disease, which that was only a couple of miles from my home, by the way. You talked about our biosurveillance and detection systems, and made the clear point that they are not as robust as they should be or could be.

Dr. BECKHAM. Yes.

Mr. NEWHOUSE. So could you give us some thoughts about some of the obstacles perhaps that are there, and some of the things that maybe we could help impact to improve that?

Dr. BECKHAM. Sure. And let me say, I want to come back to we have made a significant amount of progress.

Mr. NEWHOUSE. Yes, all right. Right.

Dr. BECKHAM. We have the National Animal Health Laboratory Network, we have the USDA supporting that network, DHHS supporting, that we have developed new diagnostic technologies. But what can we do? So early detection is always the key. So continuing to support the known and supporting the known to a high-

er level. In my testimony I pointed out what the LRN funding is as opposed to the National Animal Health Laboratory Network funding. And if you take a look at how those labs operate, I mean we are key to seeing any zoonotic diseases coming through those labs at any one point in time. So definitely enhancing the funding to the National Animal Health Laboratory Network. Biosurveillance, I come back to it, biosurveillance, robust biosurveillance depends on obviously the ability to get first responders involved, veterinarians out in the field collecting information, but it also depends on the ability to protect the data of the industry. And until we can do that, we are not going to have the robust biosurveillance system that we need.

That biosurveillance system consists of veterinarians out in the field collecting information. We have it in more near real-time. We are beginning to develop mobile applications that can come back to a centralized location so you can take a look at anomalies in animal health. Continuing to work with USDA and DHHS. That is actually a DHHS-funded project, but it is in very strong partnership with USDA. I think that particular area, again, enhancing the known, having the countermeasures on the front side, all of those are things that we can do to ensure that we are——

Mr. NEWHOUSE. Okay.

Dr. BECKHAM.—more prepared, that we catch it upfront, and that we can get it under control when it does happen.

Mr. NEWHOUSE. So you talked about the importance, and we learned this very well in Washington State about traceability and knowing your animals, where they came in contact, and where they have been and where they have gone. How are we doing nationally there?

Dr. BECKHAM. Well, there are some projects out there. Obviously, the swine industry has the premises ID and that is really helpful for being able to take a look at where animals are moving and so forth. And so we worked very closely, actually, when I was at Texas A&M, with the swine industry to develop a biosurveillance system that is based on the prem ID and the movement of swine.

The other industries, it is going to be a little bit more challenging, but looking at DHHS, again, has funded a project in biosurveillance where you can look at unique identifier, and as long as that data can be maintained confidentially and it is not subject to FOIA, those are things that we can work with the industries to move forward.

If you ask right now how several states are doing it, a lot of it is paper-only, but I will say USDA recently invested, and with the State Animal Health Officials Offices in several different states, on a system that they deployed to hold a lot of their animal health——

Mr. NEWHOUSE. Right. Right.

Dr. BECKHAM.—information. And so they are making progress in that, but we still don't have the real-time capability that we need, and sometimes during those trace-outs and trace-backs can be difficult.

Mr. NEWHOUSE. Yes, but essential. Yes.

Dr. BECKHAM. Absolutely.

Mr. NEWHOUSE. We have to have them, yes.

Dr. BECKHAM. Right. I have heard some state vets, and this was a while back, this is not recently. Again, I want to point out USDA has invested in a system, and they are in the process that has been deployed out into the states where they can actually have animal health information in those states collected into that system, and it is called USA Herds, and then there is another one out there—

Mr. NEWHOUSE. Yes.

Dr. BECKHAM.—as well. But I will tell you, I have heard animal health officials say that they literally have to go into boxes and dig through where animals have moved to and from, and that is just not going to be a doable thing—

Mr. NEWHOUSE. Yes.

Dr. BECKHAM.—and if it amounts to these outbreaks.

Mr. NEWHOUSE. Yes.

Dr. BECKHAM. So we have to get more real-time, and we have to take advantage of the technologies, but most of all, we have to be able to incentivize the industry to utilize those systems. And the way that we are going to incentivize the industry is to give them something back. We can't just take, take, take, we have to give back. We have to give them back something that helps them in their production, and we have to ensure them that we are going to protect that data.

Mr. NEWHOUSE. Yes, absolutely.

The CHAIRMAN. The gentleman's time has expired.

Mr. NEWHOUSE. Thank you very much.

The CHAIRMAN. Mr. Davis.

Mr. DAVIS. Thank you, Mr. Chairman.

The wonderful opportunity we have to ask questions sometimes at the end of the hearing means that all the questions I had written have already been taken. But that is okay. My colleagues, they know I am never at a shortage of being able to use my time to ask any other questions.

This is an issue that is very important to me, since I represent central Illinois, and what I would consider the breadbasket of America and the world. And agro-terrorism is a concern that I don't think many of my constituents think about. So the discussion we have had here today, going along with your written testimony, Ambassador, you mentioned the problem that gets talked about in this Committee a lot, is we have to feed millions more people in the future with the technology, the land, and the products that we have today. So how do we continue to make America even more productive, even though we are the safest and most productive food suppliers in the world?

And, Dr. Beckham, in your written testimony, you actually stated the very elements that make the U.S. agricultural system robust and productive, also make it vulnerable to an incident. I am the father of three kids. I mean that is very scary to me, and something that I don't normally think about on a daily basis, and we hear some things that make you really scared as a parent. We have to feed nine billion people by 2050, and as you know, we have to continue to lead. And with that in mind, how do we increase our ag production both in your industry and in the grain industry too? What can we do, and how does biotechnology play a role in this?

Mr. NEGROPONTE. So I will defer to Dr. Beckham on most of this, but one is science, technology, biotechnology, for sure if you are going to have to produce 70 percent more food in the world, but—

Mr. DAVIS. How do we get some of our allies to be able to take the biotechnological products that we produce, that can produce more, that we are going to need, how do we stop them from implementing policies that don't allow us to do that?

Mr. NEGROPONTE. Well, ultimately, the truth is going to win out and so will their farmers and their own intellectual capabilities, they are going to see the benefits that this activity brings. The other issue we need to mention is waste. I mean how much, because of bad infrastructure—

Mr. DAVIS. Yes.

Mr. NEGROPONTE.—food is lost in many parts of the world because of wastage during the time that it is getting from the point of origin to the market. They estimate something like 30 percent. So the development of efficient supply chains around the world is another area where American knowledge and expertise can be brought to bear and help these countries out.

Dr. BECKHAM. So I would agree, and I would say, going back to the science and technology, that eventually, based on the science, that the truth will win out. And we have to have that scientific evidence, obviously, that it is safe.

I think the other way is through international training and helping people become more efficient, and looking at more of the global perspective. I think we have to take a look at that. I mean if you take a look also about Foot and Mouth Disease really drops production in animals, but yet abroad they don't allow recombinant vaccines to be utilized. And so how do we turn that table to allow the use of new technologies and new innovations abroad to help us control some of these more devastating diseases that drop milk production and that drop production in animals. So those are things that over time, when we have to feed nine billion people, are going to come to the forefront, and the world as a whole, working with OIE, again, I come back to working with our international partners and the World Organisation for Animal Health, to get the truth out about genetically modified recombinant vaccines and production, and so that we can begin to educate and train and use these innovations to increase our food supply.

Mr. DAVIS. This is fascinating to me. And your discussion about biosurveillance programs and what we need to do that in addition to producing more here in America is something that I hope this Committee continues to look at and highlight. And I want to commend the Chairman for having both of you here today. So thank you for your time today.

And I will yield back the balance of my time.

The CHAIRMAN. The gentleman yields back.

Mr. Rouzer, 5 minutes.

Mr. ROUZER. Thank you, Mr. Chairman. And thank you both for being here today. I appreciate it very, very much. And I found both of your testimonies very intriguing.

I have always felt like if we got our agriculture policy right, our energy policy right, and our infrastructure policy right, we are in the catbird seat for centuries to come.

Now, one issue that is very, very intriguing to me, and I am trying to wrap my mind around it, Mr. Ambassador, you talked about it a little earlier during the course of this hearing, and that is water. I never would have thought when I was growing up as a kid that one day I would be drinking a bottle of water that you buy. When I was growing up, if you wanted water, you just went to your garden hose. And much less never would have thought anybody would pay \$5 for a cup of coffee. So the world changes. And certainly, water is becoming more and more of a scarce resource. In agriculture you can't grow anything without the sun and without water. Mr. Newhouse and I, and several other Members, were in Israel earlier this year during the course of the August recess, and they do a magnificent job over there of water conservation and recycling of their water. And I believe, if I recall, they recycle close to 80 percent of their water there. So I am just curious, based on your experience and your thoughts, if you could talk more about water and the issue, and what we need to be doing here in this country. Obviously, it has been a very acute problem in California and other parts of the country based on the climate, *et cetera*, and it is something we really need to start thinking about now. And so I am just curious your thoughts and analysis of that.

Mr. NEGROPONTE. Well, first of all, what you mentioned about your experience in Israel I think has to do a little bit with this whole culture of waste not, want not. I mean they value every scrap of material resources they have, and they do their best to conserve them. So part of it has to do with an attitude. There are some other areas of the world where governments and societies are not well enough organized to cope with the water problems they have. Like we were talking about, the situation of drought in Syria that happened to coincide—I am not saying it caused the civil war, but it happens to coincide with a period of real civil strife. So they have really got a very difficult situation.

I worry also about water contamination. I used to look at the Tigris and Euphrates River when I was serving in Iraq, and I was wondering what the heck was going into that river from the source countries all further to the north, and then all the way down along the way. So there is the problem of water contamination which is also a serious issue.

Ultimately, the market is going to help us resolve these issues because there is going to be a time when water is just going to be more costly for us and for our society to protect and preserve, and as that happens, we are going to take a more careful and judicious attitude towards the management of water. But we are going to probably do it—on the way, we will probably pay a few expensive lessons to get to that point.

Mr. ROUZER. Dr. Beckham, do you have any thoughts on that?

Dr. BECKHAM. No, I am sorry.

Mr. ROUZER. Thank you, Mr. Chairman. I yield back my time.

The CHAIRMAN. The gentleman yields back.

Mr. Thompson, for 5 minutes.

Mr. THOMPSON. Thank you, Mr. Chairman. Dr. Beckham, Ambassador, thank you so much for being here. This is a gravely important topic. There is a lot at risk if we don't properly prepare, obviously.

Dr. Beckham, the numbers that you shared in America how we are blessed with affordable food, 6.4 percent *versus* a range of 11 to 47 percent; 9.2 percent of our jobs, \$1 trillion business, a huge part of our gross domestic product. There is a lot at risk from many perspectives there, on all fronts.

Dr. Beckham, the most recent ag listening session I did, I was with a group of producers. We spent a morning talking about their issues, concerns, hearing what was on their mind, and they identified basically what they saw as some threats, obviously, to food security or food insecurity. Workforce was on there, regulations was on there. They talked about what it is like to be a producer and to have a regulation you have to follow, and the guidance you are given is 1,000 pages from USDA. And then, of course, bioterrorism came up as well.

Now, you have shared some recommendations to deal with the agro-terrorism. What I see is the food integrity perspective for food safety, and really some good things. Incentivize interdisciplinary work, better centralized coordination, better surveillance and education. I wanted to run by you one of the solutions that these producers shared with me, to get your thoughts on. It was more front-line, actually, but it was to see more of a presence through our extension program, which I am a huge fan of extension. There aren't many places where we have an agent that is really focused with an expertise on food safety or integrity, and to have that—now, that is really a boots on the ground level, but somebody to be there to counsel, to advise, to guide producers around these food safety and what I would call food integrity issues. I wanted to get your thoughts on what these folks had suggested.

Dr. BECKHAM. Absolutely critical. Absolutely. So I would say that having a robust extension system out that could help talk about things and help with workforce development, that could help do training in biosecurity, that can help talk about the business continuity plans that have been developed, that can help talk about the new veterinary feed directives, and all of those types of items with our producers, being on the frontline. Ag extension is so incredibly important, and we should support that more across the U.S. Obviously, in Texas there is a very robust ag extension program, and I would like to see that ag extension program come back nationally, and that there be more boots on the ground interfacing with our producers. That is where the land-grant universities play a role. That is what a land-grant mission is. We should be taking the knowledge that is in the research side of the land-grant and getting that out to our producers, and that will help us have a more safe, secure food supply if we do that.

Mr. THOMPSON. Very good. Thank you. I was a proud graduate of another land-grant university, Penn State University. I couldn't agree more.

Ambassador, the sixth trend you mentioned was energy prices, the impacts on production costs and diverting more crops for fuel. In your view, what ways might this issue be addressed by Congress?

Mr. NEGROPONTE. Well, just generally speaking, I think for Congress to do whatever it can to ensure that energy prices in this country and in the world are governed by market conditions. I

think wherever there are restrictions to trade and energy, I think that that can have an inhibiting effect on the market. I am thinking particularly of allowing energy exports from the United States, which would be a good thing rather than a bad one, and it could have a salutary effect on the global market.

Mr. THOMPSON. In your testimony, you had referenced the importance of research, and research, obviously, in agriculture and agricultural issues through our land-grant universities. So I want to sort of revisit with you what I talked with Dr. Beckham about. What do you see the role of research or land-grant universities when it comes to food security? How important is that, what role should it play?

Mr. NEGROPONTE. Well, I said right at the beginning of my statement that the establishment of the Homestead Act in 1861 was revolutionary legislation, to which we can attribute a significant measure of the success of our agricultural system. So I think that needs to be continued. And it is also a good role model for other countries in the world seeking to establish robust agricultures of their own. In both senses it is very important.

And then last, we need to keep up these capabilities. Whether it is for biosurveillance or for all the other things that are necessary in the field of agriculture, we need to maintain a strong agricultural agro-scientific capability here in the United States.

Mr. THOMPSON. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

Mr. Allen, for 5 minutes.

Mr. ALLEN. Thank you. And I had to run out for a moment. I have two hearings going on here simultaneously, but I want to thank you for your testimony earlier. And I want to express to you that I do believe that if we can help other countries develop their agriculture, then I believe that that country will be a friend for life. I grew up on a farm, it is very important not only to feeding people, but it is also very good as far as dignity and the ability to produce something, particularly as valuable as food is, particularly in certain areas of the world.

I guess my question is, there are some nations, obviously, that are difficult to deal with, but are we doing all we need to do in those nations, some kind of mind, I have been on mission trips in several areas of the world; Moldova, Kenya, South Africa, South America. Are we doing everything that we need to do from the standpoint of this House, as far as making this available to these countries?

Mr. NEGROPONTE. As far as—I didn't catch the last—the very last part?

Mr. ALLEN. Do you have anything that we need to be doing here—

Mr. NEGROPONTE. Yes.

Mr. ALLEN.—as a body—

Mr. NEGROPONTE. Yes.

Mr. ALLEN.—to extend the friendship of agricultural—

Mr. NEGROPONTE. Right.

Mr. ALLEN.—development and that sort of thing to—

Mr. NEGROPONTE. Yes.

Mr. ALLEN.—those countries that we do have a relationship with?

Mr. NEGROPONTE. Yes. Well, I mean first of all, I agree with you that it is something that is very positive. I think these scholarships and these grants that you give to people that the Agriculture Department and USAID gives for people to come here is a very positive thing. So you need to keep your eye on the funding for those programs so that it doesn't atrophy or disappear.

I think the other thing, I was mentioning this earlier, I am not sure you were in the room at the time about maintaining the presence of our own people, Agriculture Department and others, abroad so that they can be ambassadors for U.S. agriculture abroad, and they can make very good friends. They can also help identify people, upcoming talent that may be good candidates for scholarship activity of some kind or another here in the United States. But I couldn't agree with you more that, in terms of relationship-building, agriculture, given its tremendous standing here in the United States and its high quality, is an excellent diplomatic tool.

Mr. ALLEN. On the other side of that equation, nations that we have assisted, or maybe they have done this on their own, we tend to have conflict with through the WTO and Brazil as far as the cotton market. Right now, in our production of cotton, the world market price is 60¢, and obviously, our farmers can't make it on that. In your travels and your understanding of the world needs, how can we come together on the fact that we don't want to threaten our farmers, but at the same time, we want to help these other folks?

Mr. NEGROPONTE. Yes. Well, you have mentioned a particularly sensitive example, right, the cotton, and it has been an issue particularly with Brazil for, what, I guess, several decades, if I am not mistaken. And so we have some of these sensitive agriculture products of our own as well, I mean other ones. But for the great majority of these products, we have tried to develop free trade relationships with countries, and ultimately that is probably the best way to go, and to the benefit of agricultural competitiveness and the quality of agricultural production.

Mr. ALLEN. Well, as far as trade agreements, I agree with you.

Mr. NEGROPONTE. Yes.

Mr. ALLEN. We need to have understandings with each nation, particularly those that we want to do business with.

Well, I yield back the remainder of my time, Mr. Chairman.

The CHAIRMAN. The gentleman yields back.

Mr. ALLEN. Thank you.

The CHAIRMAN. Thank you.

I now recognize myself for 5 minutes.

Ambassador, Bob Goodlatte couldn't stay to get to his question. Can you expand a little bit on what GT was talking about with respect to energy costs and crops that we use. His specific question was, could you elaborate on the policy of potential impact that the diversion of crops to fuel could have on our food security? In your testimony, you talked about the amount of corn crop that goes into ethanol *versus* foods.

Mr. NEGROPONTE. Right.

The CHAIRMAN. Could you expand on that a little bit?

Mr. NEGROPONTE. Well, again, I think that perhaps the marketplace is going to also deal with that issue over time. Because it is kind of hard to sort of allocate and get into some sort of a command economy type of situation where you say you are going to allow product X to be used for one purpose but not for another. But I suspect that is going to sort itself out over time, especially with the development of all sorts of other alternative energy possibilities, going forward.

The CHAIRMAN. Well, thank you.

Dr. Beckham, we have spent a lot of time talking about Foot and Mouth Disease and the impact it would have. I am genuinely concerned with the feral hog population that is exploding in some places. If it were to get introduced by accident or on purpose into that population, I understand if you can control it in a particular herd, but what if it got into the feral hog population, what happens to us then?

Dr. BECKHAM. It would be very difficult to control if it gets into the feral hog population. With over four million feral hogs probably in the State of Texas, it would be a nightmare with the interface that we have between feral hogs and several of our farms and production systems. So—

The CHAIRMAN. Can—

Dr. BECKHAM.—that is where biosecurity becomes really important.

The CHAIRMAN. Yes. What do you think our trading partners, what would their reaction be to an outbreak with respect to cattle and beef—

Dr. BECKHAM. Yes.

The CHAIRMAN.—that weren't necessarily affected, but just the threat of if we had the outbreak in the feral hog population, what do you think our trading partners' reactions would be?

Dr. BECKHAM. I think they would obviously look to the U.S., but close doors on trade for a period of time until you could demonstrate the domestic animal population was free, and that would be a very difficult road.

The CHAIRMAN. All right, guys. Both of you, the time that is left, talk to us about how a safe food supply fits into overall U.S. national security, just to kind of hammer that one more time. Ambassador first.

Mr. NEGROPONTE. Well, I mean it is absolutely critical. You don't want to have eruption of crises with respect to the safety of our food. And probably the best way to deal with it is to continue to have the kind of surveillance and other monitoring types of capabilities that we do have, and we have to constantly be on our guard.

The CHAIRMAN. Dr. Beckham?

Dr. BECKHAM. And I would just reiterate that and say, obviously, agriculture is just absolutely critical to our food supply and our national security, and the things that we have to do to continue to address that include everything from investing in the One Health concept, biosurveillance, working really closely with our industries. I think that one is probably one of the most important ones, is that we really work closely with them to figure out what their needs are, to help them to help us understand how they do business, how

they move animals, where they move animals, and how we can help them continue to do those things in the event that we do have a disease incursion of some sort.

The CHAIRMAN. Dr. Beckham, you have mentioned the One Health initiative, One Health concept several times. Would you walk us through that?

Dr. BECKHAM. Okay. Well, as stated earlier, the One Health concept has been around for quite some time, and it is just a concept that animal health, human health, environmental health are linked. So whether it is with diseases or with a toxin, or with some other agent, or just in general, we all have to inhabit this planet together, and so we have to understand that whatever happens with animal health affects our food supply, diseases that can jump from animals to humans, it is all a One Health concept. We have to begin to approach critical challenges that affect us today in a more comprehensive way. So we can't just look at things in a silo. USDA can't be working on a vaccine for Rift Valley Fever and so can somebody with HHS, with no concept of what each other is doing and direction, because then we are duplicating funding efforts and we are not working in the same direction. Not saying that is happening, but I am saying those types of things don't lead us to really take a holistic approach as to the One Health. So what does a disease look like in animals, is it able to hop over to humans, can we develop animal models of human diseases like cancer. So all of that is the One Health concept. And really starting the institutionalize it, again, the concept has been around for a very, very long time, but it is really hard to get momentum behind that without some equalization of funding and some larger body that is incentivizing that One Health approach to our greater challenges.

The CHAIRMAN. Or some monster crisis.

Dr. BECKHAM. Right. Which we don't want to be reactive, we want to be proactive.

The CHAIRMAN. Well, I want to thank both of our witnesses. Today's hearing was entitled, *American Agriculture and Our National Security*, but I want to thank both of you. This is the inaugural event for this issue. We are going to continue to explore this thing over time, and to continue to help broaden the narrative that agriculture weaves its way through almost every aspect of national security and world security, starting with Kika de la Garza's famous quote, "If we can't feed them on submarines, then they are not going to be able to fight." Through everything, infrastructure, the impact that threats to infrastructure has on agriculture, whether it is shipping lanes or domestic infrastructure, the various bio-defenses and biosurveillances, everything that goes on, to people going into a restaurant or at the grocery store buying something, they automatically assume it is safe. You don't ever question that. That confidence we have in the current system could be shaken dramatically if we are not careful, and the impact that strong ag economies have on every nation, the prosperity created by strong agriculture is a good offensive weapon against every aspect of peoples' lives, where they don't have jobs and they can't provide for themselves, is impacted positively by strong production agriculture

in every nation. So, Ambassador, thank you. Dr. Beckham, thank you very much and bless you, for being here with us this morning.

And as I said, we will continue this narrative about how production agriculture weaves into the broader security issues across this world as we move forward, and helping to create some sort of grand strategy approach to looking at all of these issues.

Under the rules of the Committee, the record of today's hearing will remain open for 10 calendar days to receive additional material and supplemental written responses from the witnesses to any questions posed by a Member.

This hearing of the Committee on Agriculture is adjourned. Thank you.

[Whereupon, at 11:55 a.m., the Committee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED STATEMENT BY MARSHALL L. MATZ, J.D., PRINCIPAL ATTORNEY, OLSSON
FRANK WEEDA TERMAN MATZ PC (OFW LAW)

Chairman Conaway, Mr. Peterson, Members of the Committee, thank you for allowing me to submit a statement for the record on American agriculture and national security.

First, to directly answer the question that is implied by the title of the hearing: Yes, there is a direct link between American agriculture and our national security. Food insecurity has a direct impact on national security—both U.S. national security and political stability around the globe. American farmers and ranchers make a direct contribution to our national security, as does the U.S. Department of Agriculture (USDA), U.S. Agency for International Development and American political leadership.

- Our farmers and ranchers produce a safe and ubiquitous food supply for the American consumer, at the lowest cost in history, and then export much of it to help feed the rest of the world.
- U.S. agriculture research especially that conducted by our land grant institutions, benefits the entire world. From the Borlaug Institute at Texas A&M, to the corn research at Iowa State, to the wheat research at South Dakota State University, these are just a few of the many institutions contributing to both food and national security.
- Under the leadership of the United States, the G8 and G20 have adopted global food security as a high priority, with a special effort aimed at Africa.
- Finally, the United States and American agriculture is the leading contributor to food assistance through the United Nations (UN) World Food Programme.

In the last several months, there has been a lot of attention on a number of separate issues and events which impact global food security across a range of activities. From Pope Francis' visit to the United States and the announcement of the *United Nations 2030 Sustainable Development Goals*, (<https://sustainabledevelopment.un.org/topics>) to the ongoing trade negotiations and the discussion of genetic engineering and biotechnology, they all have an impact global food security.

From my perspective, therefore, the question is not *whether* American agriculture impacts national security, but *how* to achieve global food security? What would it take to reach the UN goal of eliminating hunger by 2030? There are a number of key pieces to that puzzle.

As Pope Francis noted during his recent trip to the U.S., "The fight against poverty and hunger must be fought constantly and on many fronts . . ." The number of hungry people in the world—795 million—has dropped by 100 million over the past decade, thanks in no small part to coordinated international efforts led by the U.S. According to the USDA, Latin America and the Caribbean region saw the steepest declines in the number of food-insecure people, followed closely by Asia.

According to the State Department, to feed a growing world population, we need to increase global food production by 70% before 2050. Women make up the majority of the agricultural workforce in many areas of the world. Yet, today, for every investment we make in producing food, we fail to get the best results because many women lack the access they need to land, seeds, water, credit and markets.

That is particularly true in Africa, as pointed out recently by Dr. Agnes Kalibata. Dr. Kalibata, who was the Minister of Agriculture in Rwanda responsible for a dramatic turnaround in the country's food security, is now the President of the Alliance for a Green Revolution in Africa (AGRA). "Africa is the last region of the world to go through an agriculture transformation," she notes. "Africa has lagged behind for a number of reasons, including lack of access to improved seeds, fertilizers, mechanization and irrigation. The good news is that we are starting to see positive changes. A real African agriculture transition is underway. We are very single-minded about closing the yield gap for smallholder farmers and especially women farmers."

Africa is a key to global food security because the continent contains a majority of the world's underdeveloped agriculture land. Further, yields are so low . . . only 10% of our yields . . . that they can be increased dramatically by getting smallholder farmers access to modern seeds, inputs and educational services.

Agriculture: U.S.-Africa Comparison

(Mr. Strive Masiyiwa, World Food Prize—October 16, 2014)

	U.S.	Africa
Percentage of people who farm	~1%	~65%
Cost of food as a percent of disposable income	~9%	~70%
Agriculture trade	Export \$140B	Import \$35B
Corn yields bushel/acre	~180	~20

Reproduced from Matz (2014), *Africa Rising*.

The distribution system in Africa has to be a major focus of attention. Whether through private sector agro-dealers, community groups or government, smallholder farmers in very remote villages must gain access to the tools of modern agriculture.

The newly released UN 2030 Agenda for Sustainable Development places a high priority on agriculture and empowering women. Included in the 17 Sustainable Development Goals is a commitment to double, by 2030, the agricultural productivity and incomes of small-scale food producers, particularly women.

At the other end of the technology divide, in the United States and other developed countries, there must be enough political courage and consumer confidence to follow sound science. Yes, that means accepting genetic engineering (GE) for agriculture production just as we do for health care. The bottom line is that GE crops raise crop yields, uses less water and require fewer inputs, which improves the environment.

Last month, the United States and China released an important joint cooperation statement to promote a strong global economy. As a part of that process, according to the White House statement, “The United States and China conducted in-depth discussions on the administration of agricultural biotechnology, and committed to further improve approval processes. Both sides reaffirmed the importance of implementing timely, transparent, predictable, and science-based approval processes for products of agricultural biotechnology, which are based on international standards.”

This position taken by the U.S. with regard to China on the importance of regulatory synchronization should now be extended to the fifty states here in America. The Federal Government cannot allow each state to implement its own GMO labeling system and expect interstate commerce to continue without interruption. It is simply not possible or reasonable. Congress and the Administration must come together to preempt the states (as the House has done), and develop one national system that is uniform and science-based.

Agricultural biotechnology, by itself, is not the answer to global food security, but it is a part of the solution and it is important that consumers have confidence in the technology. In order to achieve global food security, there must be a consistent policy across a range of issues. If the United States is going to push China on biotechnology, it should also preempt the states so there is one national GMO labeling policy.

Let’s also realize that, even if we could wave a magic wand and implement all of these steps, there would still be hungry people in the world. There will always be natural disasters, droughts and civil wars. Today, some 60 million people are displaced by violence, conflict and/or repression. The World Food Programme (WFP) is an extraordinary organization, but is being stretched beyond its capacity. WFP doesn’t have the resources to help refugees, the victims of natural disasters *and* farmers who are not producing enough to sustain their family. Half of all the hungry people in the world are actually farmers. Boosting the production of smallholder farmers would allow WFP to focus on emergencies.

In short, global food security is in sight. If it is made a priority, the new UN goal to eliminate hunger by 2030 can be achieved. American agriculture has been at the center of the U.S. economy since President Lincoln established the Department of Agriculture. While the American farmer is now so efficient that only 1% of the population feeds the entire country and much of the world, agriculture remains a mainstay of our economy and a major part of national security. Thank you.

Marshall Matz is an attorney with OFW Law in Washington, D.C. He served as General Counsel to the Senate Select Committee on Nutrition and Counsel to the Senate Committee on Agriculture. He was the Founding Chairman of the World Food Programme—USA. He continues to serve on the Board of the World Food Programme, USA and the Congressional Hunger Center. This testimony represents the opinion of Marshall Matz, not his law firm, clients or any organization.

SUBMITTED QUESTION

Response from Hon. John D. Negroponte, former Ambassador; Vice Chairman, McLarty Associates

Question Submitted by Hon. Mike Bost, a Representative in Congress from Illinois

Question. In your testimony, you mention that trade policy is changing the world of agriculture, and offers immense opportunities especially for farmers in my district in Illinois. With the possibility of nine billion people on the planet by 2050, we need to produce more food on less land leading during that time. Given the proven safety of our biotechnology, do you believe our trading partners, especially in Asia, should be more expedient with their approval process and what should our government be doing to encourage or compel them to accept our proven biotech crops?

Answer. To feed the coming world of nine billion we need modern technology, open borders, and to conserve vital resources such as land and water. Technology will play a central role in achieving this goal. To ensure that agricultural innovation continues, policy must be supportive. Internationally, this means that our trading partners should use sound science when evaluating new products, including those derived from biotechnology.

To achieve this, we need to continue addressing market access issues for the novel products both through bilateral and multilateral channels. However, this is not enough. We must engage more effectively with stakeholders outside government, including agricultural producers, the media, and the general public. Without deeper and more proactive outreach, we miss the opportunity to reduce widespread science skepticism. Unless we can convince the “anxious middle” of the safety of modern agricultural production technologies, we risk finding ourselves in a situation where resistance has stifled innovation and our ability to feed the world.

